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(54) Wireless system for broadcasting, receiving and selectively printing packets of information

(57) According to one embodiment of the invention, a system is provided for dispatching one or more packets of information, such as redeemable coupons, messages, appointment reminders, confirmations, tickets, warnings or written packets, to potential recipients of said packets at remote locations. The steps included in such a system are: (1) developing a subscriber directory (10) containing unique identification information for each of said potential recipients; (2) creating a packet to be dispatched to at least one of said recipients; (3) identifying the potential recipients for a particular packet; (4) transmitting said packet through a wireless pager network (7) to a network (80) of printer appliances (82) associated with all of said potential recipients; and (5) receiving and selectively processing and printing only those packets intended to be processed and printed by said appliance. Each printer appliance (82) includes means for receiving said packets of information transmitted by the wireless pager network; means for analyzing said packets to determine whether said packets are intended to be processed and printed by that particular appliance; and means for printing said packets of information.

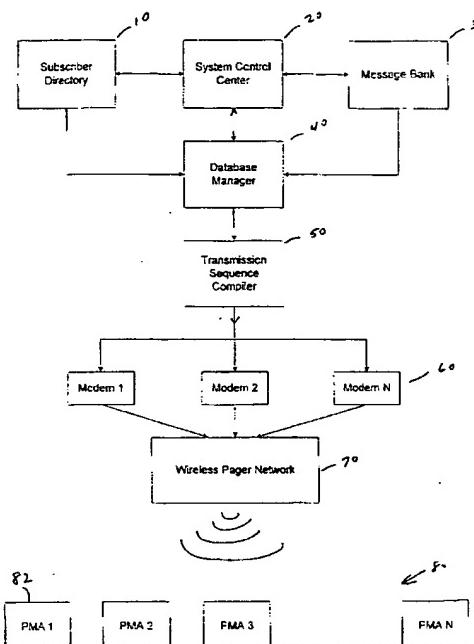


FIG. 1

Description**1. Field of the Invention**

[0001] The present invention relates generally to a wireless system for broadcasting, receiving and selectively printing packets of information such as redeemable coupons, messages or virtually any packet of information or graphics and, more particularly, to such a system which comprises method and apparatus for selectively broadcasting such messages through conventional pager network to a network of printer appliances that are adapted to convert such messages to a readable permanent format such as, for example, a printed copy. Bit-string means can be used to permit the printer appliances to selectively process only those messages intended to be printed, i.e., only those messages which have bit-strings that match the bit-strings of the printer appliance. A printer appliance adapted to receive and selectively process and print only packets of information intended to be printed may also be included in such system. In its broadest form the subject system in essence creates a universal delivery system for virtually any type of information packet that is currently delivered using conventional means such as the United States Postal Service or overnight delivery service such as Federal Express, etc. One particularly unique application for such system is the broadcasting and generation of redeemable consumer coupons in printed format that can be redeemed by consumers at retail outlets although it should be appreciated that the system of the present invention has applicability in generating virtually any type of printed message.

[0002] In an alternative embodiment, an enhanced version of the CouponDirect units having high capacity and industry grade performance characteristics is provided in a retail environment in which users can interact with the web site to select offers of interest. Response from the web site server to the PC is simply a coupon order validation number, and possibly a set of selected coupons rather than the actual printed coupons themselves. These numbers are then keyed into an in-store validator at the retail location chosen by the consumer while online that issues the actual coupon. Such a process retains the anti-fraud measures inherent in the CouponDirect system with high print quality and an added security feature of the in-store validation and providing the consumer with the ability to select or choose the offers most valuable to them in the comfort and privacy of their home, office or wherever they have internet access.

Optionally, the coupon can be delivered in a totally electronic method directly to the check-out register with the consumer being provided a "memory jogger" to remind them to redeem the coupon upon check out. Such a method provides a highly secure, electronic clearing process since redeemable script is never issued.

[0003] When printed hard copies of coupons are re-

quired, the system contemplates the use of dedicated secure printers or printer appliances of the type described in greater detail in copending parent application Serial No. 09/095,820 filed on June 11, 1998 in the name

5 of Robert T. Kulakowski, Robert Marshall and George J. Rogers for Printer Appliance for Use in a Wireless System for Broadcasting Packets of Information, the disclosure of which is incorporated by reference thereto.

[0004] As might be anticipated, a different output form 10 and media, can radically change the usage mechanics, and potentially add new and inventive features to the overall distribution system. This disclosure describes how the integration of a smart card reader/writer, the addition of inventive software routines, and linkage to an 15 Internet channel, can add significant versatility to the overall system performance.

[0005] The smart card is a natural extension of the familiar magnetic stripe storage system as used on credit cards. The smart card however has an on-board chip 20 with processing and high-density storage capability. The conventional credit card comes up to about 100 static characters, whereas the simplest smart card can easily accommodate 1000 characters. Moreover, the smart card functions in a dynamic read and write mode so that

25 real time transactional processing can be done right onto or from the card.

[0006] Probably the most common usage of smart 30 cards in the United States is the GTE Smart Phone Card product where a consumer pre-pays an initial amount, e.g., \$50, which can be used toward the purchase of telephone service. The initial \$50 credit is embedded on the smart card. OGTE has added a smart card reader at selected telephone booths and as calls are made the card computes time charges automatically and adjusts 35 the remaining balance.

[0007] Major manufacturers such as Motorola, Philips and Hewlett Packard are producing smart card chip 40 components on a regular product basis. New and improved versions are continually released as the technology advances. Acorn, Gemcon and Schlumberger are original equipment manufacturers who integrate the chips into their microelectronic assemblies and transfer them to plastic substrates such that the finished unit has an appearance similar to a regular credit card.

[0008] Smart card use in the United States has lagged 45 considerably behind other countries. For example, Australia has an advanced telephone card system and is supplying Coca-Cola with a card system for use in their vending machines. There are many active applications in Europe ranging from the use by the British armed services of smart I.D. tags to Blaupunkt, the German auto stereo supplier, that uses a card to maintain personal radio station selections--the ultimate solution to re-tuning your car stereo after junior has borrowed 50 the car.

[0009] According to the recent article from Shepherd & Wedderburn, smart card technology enhancements 55 are paving the way to the realization of a real electronic

purse. The conventional purse frequently contains checks, credit cards, coins and paper money. In the United States, it also often contains manufacturer discount coupons where nearly \$5 billion are redeemed annually. It is evident that electronic, discount coupons could also fit readily into this virtual purse.

2. Description of the Prior Art

[0010] The dispatch of packets of printed information to individual households including, for example, the transmittal of consumer coupons is well known. Individuals are accustomed to receiving such printed messages from a variety of different sources including, for example, the mail, overnight delivery services, house to house door-hanger crews, private runner services, the print media and the like. Conventional methods for dispatching and delivering such printed messages to a large number of individual households are limited severely by the need for manually handling and delivering the printed copy. While these vehicles are capable of handling large volumes of messages on a daily basis, the need to manually deliver such messages imposes certain constraints on the system in terms of both cost and delivery time.

[0011] Telecommunications systems for conveying and delivering messages have improved rapidly over the past decade. For example, facsimile systems have become a common method for the distribution of printed messages and other communications. The speed and cost of such facsimile systems are quite favorable when compared with the conventional methods described above. Facsimile transmissions are, however, severely limited in terms of reach and, generally speaking are inappropriate for mass, broadcast messaging. The appeal and utility of such transmissions is also somewhat limited by the requirement and expense of telephone line connections.

[0012] More recently, the Internet has become a very potent force in delivering printed messages. As with all other forms of delivery systems, however, there are constraints in terms of reach capability, line connection, and the need for a computer and operating software and auxiliary and ancillary systems. Moreover message recipients must have a certain degree of computer literacy and, most importantly, the user must assume an active role if the printed messages are to be received.

[0013] For years, manufacturers have eagerly sought novel distribution methods for their coupons. One such novel method was developed by Catalina Marketing that issues printed coupons at checkout lanes in retail establishments. This distribution method is now widely accepted despite the fact that the coupons are for use on the next shopping trip. Targeting, in this case, is very precise because it is based upon consumer selection of the offers most attractive to them. Since there is category exclusion and a limitation on the number of offers at the point of sale (POS) terminal, distribution volumes

are much smaller than FSI's. This reduced number is, however, offset by a significantly higher redemption rate since the coupons were specifically requested rather than broadly distributed. The Catalina Marketing system 5 uses coupon printers installed in checkout lanes at almost 12,000 stores nationally.

[0014] The use of the Internet for distribution of coupons has received a substantial amount of attention in recent years, however, this system is severely handicapped by serious concerns with fraud. The illegal copying of coupons has been a persistent, but relatively controllable phenomenon with traditional coupon vehicles. As will be readily appreciated, a coupon image distributed via the Internet, diskette or CD-ROM, can be readily imported to a simple software-publishing package where changes such as value, terms of the offer, expiration date etc. can be made virtually at will. More importantly, there is no limitation on the number of copies that could be produced. If black and white coupons 20 printed on standard paper stock using conventional computer printers were deemed acceptable, enterprising individuals could easily invent and reproduce fraudulent Internet coupons literally at will.

[0015] Despite these inherent limitations, however, 25 Internet distribution will continue to grow in popularity because of its speed of communication, its low cost, its ability to precisely target an audience and the easy consumer selectivity features that it offers. Adoption of this method of distribution has, however, been slowed by an inability to provide secure printed offers and control of barcode print quality for scanability.

[0016] Supermarkets Online has been somewhat successful in deploying more secure Internet distributions from their Internet site referred to as Value Page, 30 using a system called Web Bucks. This system is based on the Catalina in-store programs and their in-lane printers. Correct use of the Internet offer is monitored by these Catalina systems and if the consumer is in full compliance with the offer, they are given a discount 35 voucher (Web Bucks) which can be redeemed against any purchase on the next shopping trip. The actual redemption of Web Bucks is also monitored closely by the Catalina control systems. This program is in its infancy but it appears that the process is being positively embraced.

[0017] Catalina systems are installed in grocery and drug store chains and Web Bucks only works as an application riding on their expensive base installation. Internet coupons are applicable to virtually all purchased 50 items so that there is a need to have a secure, yet much more general purpose system, that would be applicable to the likes of Home Depot, Office Max, Goodyear, Auto Zone, Wendy's, Pizza Hut, Black Angus, Circuit City etc., and not require the sophisticated platform and "in the checkout lane" installations essential to the Web Bucks operation.

[0018] With respect to redeemable coupons, the most common form of distribution of such products is through

the print media, i.e., either as a freestanding insert or as part of a print advertisement in a newspaper or magazine. In addition, many coupons are distributed by direct mail. Although this distribution method is slow and very costly, it can be targeted at specific recipient groups through the use of selected mailing lists. This contact approach is used extensively by mail-order marketers, telephone companies, magazine publishers, and insurance or financial service providers.

[0019] While the bulk of manufacturer discount coupons were printed and distributed in conventional methods of home delivery, some are now being presented automatically in-store, using relatively advanced communications and computer technology. For example, in one such application, a coupon is dispensed at checkout to an exiting customer for use on the next shopping trip. The particular coupon is targeted to the specific product preferences of the customer through analysis and interpretation of her current purchases. This system is supported by a vast communications network, an extensive computerized database and dedicated in-store computers. The basic purpose of this type of promotion is to encourage a return trip and influence new purchase decisions.

[0020] In another, semi-automated in-store coupon dispensing system application, discrete, electro-mechanical dispensers are attached directly to shelves adjacent to the product. The consumer can then withdraw a coupon and obtain an instant discount on the purchase at checkout. Such a system is directed more to the "impulse" purchase as the consumer moves through an aisle in the store.

[0021] A third class of automated, in-store coupon distributing systems are the kiosk or booth dispensers. These booths are generally installed in store entryways to increase exposure and take advantage of concentrated traffic. A consumer activates the system through a keyboard, touch screen or by swiping a magnetic strip card. The system then presents images of the currently available promotions and the shopper can choose coupons of interest. Problems with such a system include high initial capitalization costs, complex and high-maintenance technology, difficulty of use, and extended selection time on the part of users.

[0022] For the aforementioned reasons, none of these forms of message delivery offer particularly fast and inexpensive distribution of such messages.

SUMMARY OF THE INVENTION

[0023] Against the foregoing background, it is a primary object of the present invention to provide a system for delivering printed packets of information to designated recipients.

[0024] It is another object of the present invention to provide such a system employing a bit-string method identifying only those packets to be processed and printed.

[0025] It is yet another object of the present invention to provide a printer appliance for use in conjunction with such a system for delivering printed packets of information to designated recipients.

5 [0026] It is still another object of the present invention to provide such a system that is capable of delivering such packets at a low cost when compared to manual delivery systems.

[0027] It is yet another object of the present invention 10 to provide such a system wherein the delivery time of such packets can be controlled and, further, where the packet sequencing and dispatching capability is flexible.

[0028] It is still another object of the present invention 15 to provide such a system which has a broad and rapid audience reach and which is able to deliver packets of information virtually simultaneously to pre-determined but widely diverse recipient groups.

[0029] It is still yet another object of the present invention 20 to provide such a system where the recipient is able to automatically receive a printed copy of the packet of information using a printer appliance.

[0030] It is but another object of the present invention 25 to provide such a system that includes means to prevent the packet of information being delivered from improper or unauthorized copying as well as providing a remote disarming capability for individual printer appliances.

[0031] It is but still another object of the present invention 30 to provide such a system in which the packet can be traced to a particular printer appliance.

[0032] It is but yet another object of the present invention 35 to provide such a system that includes a series of printer appliances that require minimal maintenance and attention.

[0033] It is but another object of the present invention 40 to provide such a system having a printer appliance that is adapted to receive all broadcast packets of information but selectively process and print only those packets intended to be delivered to such appliance.

[0034] It is but still another object of the present invention 45 to provide such a system having a printer appliance that permits a packet to be traced to such appliance.

[0035] It is another object of the present invention to 50 provide method and apparatus to effect the objects and advantages of such system.

[0036] It is yet another object of the present invention 55 to such a system for delivering printed packets of information directly to high visibility and high traffic areas within a retail environment, including but not limited to, on the shelf, on an endcap (end of aisle) at the checkout, on a freestanding kiosk or display etc. within a designated store.

[0037] It is another object of the present invention to provide such a system that is capable of delivering such packets at a low cost when compared to manual delivery systems.

[0038] It is yet another object of the present invention to provide such a system wherein the delivery time of

such packets can be controlled and, further, where the packet sequencing and dispatching capability is flexible.

[0039] It is still another object of the present invention to provide such a system which has a broad and rapid audience reach and which is able to deliver packets of information virtually simultaneously to pre-determined but widely diverse recipient groups, including those within the retail environment.

[0040] It is still yet another object of the present invention to provide such a system where the recipient is able to automatically receive a printed copy of the packet of information using a printer appliance.

[0041] It is but another object of the present invention to provide such a system that includes means to store the packet of information being delivered for future printing.

[0042] It is another object of the present invention to provide such a system that includes means of detecting whether the printed packet of information has been removed and printing a new copy of the packet in the event the printed packet has been removed.

[0043] It is but still another object of the present invention to provide such a system in which the packet can be traced to a particular printer appliance, store or store chain/company.

[0044] It is yet another object of the present invention to provide such a system that includes a series of printer appliances that require minimal maintenance and attention.

[0045] It is still another object of the present invention to provide such a system that influence purchase decisions at the time of entry into a store, and/or during the entire shopping trip throughout the store.

[0046] It is but another object of the present invention to provide such a system that reinforces the coupon offer at the shelf or any linked coupon distribution at checkout.

[0047] It is but another object of the present system to provide a system whereby supplemental visual messages draw attraction to the printed information.

[0048] It is yet another object of the present invention to provide a system for supplying audio supplementary audio messages to draw attention to the printed information.

[0049] It is yet another object of the present invention to provide a motion sensing system such that activation of the supplementary systems are triggered or initiated by human presence near the present system.

[0050] It is still another object of the present invention to provide a system for generating and distributing over the Internet secure, scanable from a highly controlled print environment, packets of information including redeemable coupons to individuals who select such coupons.

[0051] It is another object of the present invention to provide such a system in which a listing of the available coupons is displayed on an Internet web site and able to be printed at the option of the consumer (the consum-

er cannot print the coupons themselves).

[0052] It is yet another object of the present invention to provide such a system in which the selected coupons or an entire coupon database may be transmitted to the consumer through a pager and/or cellular or any wireless communications network that interacts with a receiver/printer;

[0053] It is still another object of the present invention to provide such a system in which the selected coupons may be transmitted to the consumer through the consumer's computer for printing using definitive anti-fraud features, only if the consumer has the specified printer in their home.

[0054] It is yet still another object of the present invention to provide such a system in which the consumer receives a validation code that can be used with an in-store order validator for generating a coupon.

[0055] It is yet still another object of the present invention to provide such a system in which the need for a printer in the home is eliminated and the coupon selection process is expedited by avoiding consumer download and print cycle time and which opens up coupon selection capability to less sophisticated computing systems.

[0056] It is yet another object of the present invention to provide such a system in which the validation code, selected coupons or an entire coupon database may be transmitted directly to the order validator by a pager and/or cellular or any wireless communications network.

[0057] It is another object of the present invention to provide a system for distributing redeemable coupons or other packets of information in an electronic medium.

[0058] It is another object of the present invention to distribute such coupons or packets of information on a smart card.

[0059] It is another object of the present invention to provide such a system that relieves the consumer from the tedium of clipping, storing and re-accessing printed coupons.

[0060] It is yet another object of the present invention to provide such a system that relieves the consumer of the need to maintain burdensome paper coupon filing systems.

[0061] It is still another object of the present invention to provide such a system that facilitates the redemption of such coupons or other packets of information.

[0062] It is still yet another object of the present invention to provide such a system in which the individual redeeming such coupons does not have to store paper coupons in the cash drawer.

[0063] It is another object of the present invention to provide such a system that facilitates the clearing of such coupons.

[0064] It is yet another object of the present invention

to provide such a system in which clearance of the coupons is done electronically thus avoiding the expense of shipping and handling great volumes of paper.

[0065] It is but another object of the present invention to provide such a system in which the smart card can be integrated into a Retailer Loyalty Programs, thus replacing existing card systems and providing much more important information with each visit.

[0066] It is yet still another object of the present invention to provide such a system in which the smart card includes trace information (such as a pin #, usage information, household information etc) of the person redeeming such coupons.

[0067] It is another object of the present invention to provide such a system that includes fraud control methods.

[0068] It is still another object of the present invention to provide such a system that is relatively inexpensive when compared to conventional distribution channels such as free standing inserts, newspapers or direct mail. [0069] It is but still another object of the present invention to provide such a system that can be used to deliver promotions much faster and more economically than systems heretofore employed.

[0070] To the accomplishments of the foregoing objects and advantages, the present invention, in brief summary, comprises a new system for originating, transmitting, receiving and printing packets of information directly to consumers through a network of unique printer appliances. Such information may constitute messages, redeemable coupons, advertisements, warnings, appointment reminders, tickets and the like. Since the techniques are essentially electronic in nature, the system eliminates the need to physically handle or deliver such packets that vastly improves its efficiency in terms of delivery cost and time. The severe reach limitations of the facsimile and Internet systems are eliminated since the system of the present invention can operate in a broadcast mode which is optimal for mass message delivery. With the inclusion of innovative communication filters, the system can limit delivery to a single printer appliance, all printer appliances or a select group of printer appliances.

[0071] The system of the present invention does not require the installation of new telephone line connections, requires virtually no technology literacy or any active participation on the part of the recipient in actually receiving and obtaining printed copies of the information packets being transmitted. Using a novel printer appliance, packets can be delivered to the home, office, store, or automobile or virtually anywhere where electrical power is accessible.

[0072] The present system is characterized by an ability to inexpensively reach a precise target in the marketplace with minimal recipient involvement. The essential transmission methodology is through established national pager networks such as, for example, those operated by Pagenet or Skytel, which are capable of

reaching more than 90% of U.S. households. The majority of the remaining audience can be reached by building relays to operators of local pager networks. In addition, the system may work in conjunction with conventional cellular telephone technology such as, for example, Sprint, MCI, etc. as well as with dedicated satellite transmission systems, or from an RF transmitter from a cable tap, satellite dish tap, remote control or other source. Future versions may employ any current or future wireless broadcast, multicast, or narrowcast technology for transmission.

[0073] Since the audience is accessed in a virtual parallel mode by a broadcasting system, the number of required transmission channels is minimal. In addition, access/delivery costs are very low, i.e., in the hundredths of a cent for a typical packet, depending upon the size of the audience.

[0074] Although the system employs a broadcast transmission method, the incorporation of blocking filters enables the system to deliver either a specific packet to an individual appliance or to all or substantially all of the printer appliances as well as virtually everything in between.

[0075] One component of the system is a high-performance, upgradable subscriber database such as, for example, those relational type databases provided by Oracle or Informix, containing detailed bibliographic, demographic and other unique subscriber information. Such information can be obtained, for example, from appliance purchase registrations, supplier purchases, warranty activities, subscriber surveys and response information as well as from other sources. This data may be further supplemented with information such as demographic, economic, lifestyle, family formation, interests etc. from a wide gamut of outside sources such as mailing-list vendors, catalog marketers and magazine publishers. The versatility of this database combined with the selectivity of the blocking filters permits extremely precise message targeting based on definable recipient profiles.

[0076] A strong advantage of the proposed system is the incorporation of the maintenance-free printer appliances used by proposed recipients of such messages. With such devices, the recipient does not have to assume an active role in the messaging process. There is no need for even minimal technology or computer literacy since the initial setup and subsequent operation are simple and straightforward. So long as the appliance has power and paper, print messages will be automatically received. It is envisioned that most of the messages will be delivered during the night to take advantage of very low traffic on the pager network at such times. Thus, the incorporation of a printer appliance requiring minimal maintenance and attention is extremely important.

[0077] It is contemplated that the system of the present invention will have particular applicability in the promotion and advertising fields, particularly in the dis-

tribution and delivery by packaged-goods manufacturers of redeemable coupons. The majority of coupons are presently distributed as newspaper inserts or as part of a print advertisement in a newspaper or magazine. However, the device is capable of transmitting, receiving and printing almost any packet of information or graphics.

[0078] Another potential application for the information delivery system of the present invention is for providing alerts to individuals such as, for example, warnings of threatening weather, anticipated driving conditions, road construction activities, lawn watering regulations, wood burning restrictions, airport closings, and the like.

[0079] The delivery system may also be used to provide reminders to individuals of appointments such as, for example, medical and dental appointments, car servicing prompts, pick-ups from the cleaners, special event reminders, impending visits from the plumber, electrician, pest control technician, maid-service and the like.

[0080] Invoices and statements can also be delivered using the delivery system of the present invention. For example, bills of all types including utilities, telemarketing sales, event tickets, travel tickets, tickets to attractions, loan repayments, insurance, mortgage etc., may be directly delivered with huge savings in time, labor, postage and envelopes and creative preparation.

[0081] In addition, the system can be used for disseminating and printing e-mail messages.

[0082] Yet another application for the information delivery system of the present invention is to provide confirmations for airplane tickets, hotel reservations, car rentals etc. which had, heretofore, been distributed by mail or other conventional delivery system. Similar savings in overall delivery expense are attainable using the present system.

[0083] Other messages that can be distributed include, for example, forms, rebates, surveys, jokes of the day, recipes, horoscopes, lottery tickets, gambling receipts, and other personal messages.

[0084] With the explosive growth of Internet users, and expanding applications, the Internet is being seriously considered as a new coupon distribution vehicle because of the precision targeting abilities, and relatively low contact costs. A serious impediment, however is that there is no control at the printing stage of the Internet delivery process, unless the user has an in-home version of the CouponDirect PMA or RPD as described in this document, which receives either wireless transmissions or is used as an attachment to their PC via serial port. Coupons may be black and white, have no controlled security measures, can be readily copied and of questionable quality for in-store and post redemption scanning capability. Moreover the coupon image could be ported into an editing system that could easily change the offer terms and conditions, especially value.

[0085] The present invention consists of two related systems that have evolved from CouponDirect technol-

ogy that offers opportunity to embody strong anti-fraud measures into Internet coupons. The method of the first embodiment is based upon regular Internet contact to a PC user, but delivery of the actual coupon is through the regular CouponDirect process. Obviously only those people who have access to a CouponDirect printer appliance could participate. Many security features are incorporated into the controlled paper stock designed for use in the appliance.

[0086] The second related method employs the use of order validators placed throughout communities anywhere; for instance, in malls, gas stations, banks, etc., however to maximize consumer convenience the best location may prove to be at or in retail stores. The order validator is essentially an enhanced CouponDirect unit, having high capacity and industry-grade, performance. A centralized CouponDirect PMA or printer appliance or receiver-printer-dispenser (RPD) is accessible to all store visitors. Here, the consumer contacts the web site (or vices versa) and selects offers of interest. Response from the web site is simply a coupon validation number and not printed coupons. The consumer would then key these numbers into the in-store validator to authorize and print a coupon of real value. In addition to being able to utilize their coupons from the Internet on their current shopping trip (not the next trip as required by the Supermarkets Online/web bucks system), the process retains the anti-fraud measures inherent in CouponDirect, with added security imposed by the in-store validation requirement. Optionally, the coupon could be electronic and the consumer provided a memory jogger (such as a shopping list containing the selected offers) showing that a discount is available at the register for her validated coupons. This method would facilitate a highly secure, electronic clearing process since redeemable script is never issued.

[0087] It is also possible to link attach or interface the in-store validator with other communication means including, for example, an automated teller machine ("ATM"), a coin counting/rolling machine or any other electronic in-store device.

[0088] The potential user base may be vastly extended with this concept because a printer in the home is no longer essential. Order validation numbers can easily be handwritten wherever the coupon selection information is first accessed (i.e., home, office etc.) for later entry into equipment in-store. Thus laptop users, handheld computers, and office PC's, where printer access is not readily available, now become accessible coupon selection channels.

[0089] A network of receivers is provided at select locations, each of the receivers being adapted to selectively receive, process and store the transmitted packets of information and download said packets of information onto a programmable media. In one embodiment, the programmable media consists of an electronic smart card. The system may also generate a printed and/or electronic list of all packets of information, as well as

print individual packets of information.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0090] The foregoing and still other objects and advantages of the present invention will be more apparent from the detailed explanation of the preferred embodiments of the invention in connection with the accompanying drawings, wherein:
- [0091] FIG. 1 is a flow diagram illustrating the information delivery system of the present invention.
- [0092] FIG. 2 is a sample table for the subscriber directory used in conjunction with the information delivery system of the present invention.
- [0093] FIG. 3 illustrates the possible profile bit-string groupings that may be used in conjunction with the information delivery system of the present invention.
- [0094] FIG. 4 is a sample table in which the messages that are stored in the message bank of the present invention.
- [0095] FIG. 5 is an example of a daily message batch created using the message bank of the information delivery system of the present invention.
- [0096] FIG. 6 is a sample of typical message bit-string destination codes that may be used in conjunction with the information delivery system of the present invention.
- [0097] FIG. 7 is a sample table of the message code string used in conjunction with the information delivery system of the present invention.
- [0098] FIG. 8 illustrates the type of data that may be contained in a sample coupon message used in conjunction with the information delivery system of the present invention.
- [0099] FIG. 9 illustrates the manner in which the message identification numbers of the information delivery system of the present invention are created.
- [0100] FIG. 10 is a perspective view of the printer appliance used in the information delivery system of the present invention.
- [0101] FIG. 11 is a flow diagram illustrating the manner in which the printer appliance of the information delivery system of the present invention operates.
- [0102] FIG. 12 is a flow diagram illustrating the method for message content processing in the printer appliance of the present invention.
- [0103] FIG. 13 illustrates the typical eligibility bit-string filter that may be created from the data in the subscriber directory table of FIG. 4.
- [0104] FIG. 14 is a table illustrating the reception eligibility matching of the printer appliance of the present invention.
- [0105] FIG. 15 is a flow diagram illustrating the print processing in the printer appliance of the present invention.
- [0106] FIG. 16 is a flow diagram illustrating another embodiment of the information delivery system of the present invention.
- [0107] FIG. 17 is a flow diagram illustrating the manner

in which the receiver-printer-dispenser appliance of the information delivery system of the present invention operates.

- 5 [0108] FIG. 18 is a perspective view of the receiver-printer-dispenser appliance used in the information delivery system of the present invention.
- [0109] FIGS. 19-22 illustrate the various types of dispenser configurations for the receiver-printer-dispenser appliances.
- 10 [0110] FIG. 23 is a sample floor plan illustrating the placement of the various types of dispenser configurations for the receiver-printer-dispenser appliances.
- [0111] FIG. 24 is a flow diagram illustrating the CouponDirect information delivery system of the present invention.
- 15 [0112] FIG. 25 is a flow diagram illustrating the manner in which the CouponDirect printer is able to process and print delivered coupons.
- [0113] FIG. 26 is a flow diagram illustrating the manner in which coupons can be distributed on a secure basis using the method of the present invention.
- 20 [0114] FIG. 27 is an example of the secure redeemable coupon created using the process of the present invention with fraud inhibitors.
- 25 [0115] FIG. 28 is a flow diagram illustrating the in-store validation security process of the present invention.
- [0116] FIG. 29 is a sample list of offers that a consumer might conceivable select using the process of the present invention.
- 30 [0117] FIG. 30 is a flow diagram illustrating the manner in which the in-store validation unit used by the process of the present invention.
- 35 [0118] FIG. 31 describes the major features of the two processes of the present invention.
- [0119] FIG. 32 is a flow diagram illustrating the information delivery system of the present invention.
- 40 [0120] FIG. 33 is a flow diagram illustrating the manner in which the printer for the information delivery system of the present invention is able to process and print delivered coupons.
- [0121] FIG. 34 is a flow diagram illustrating the manner in which CouponDirect offers can be distributed using a smart card;
- 45 [0122] FIG. 35 is a sample smart card offer list;
- [0123] FIG. 36 is a flow diagram illustrating the manner in which a combined printed and electronic offer may be delivered;
- 50 [0124] FIG. 37 is a flow diagram illustrating the manner in which a promotion can be delivered using a comprehensive CouponDirect and Internet system;
- [0125] FIG. 38 is a flow diagram illustrating a sample smart card in-store promotion.
- 55 [0126] Referring to the drawings, FIG. 1 is a flow dia-

gram describing the information delivery system of the present invention which includes eight major components: (1) a subscriber directory 10; (2) a system control center 20; (3) a message bank 30; (4) a database manager 40; (5) a transmission sequence compiler 50; (6) a bank of modems 60; (7) a transmitter network 70; (8) and a network of printer appliances 80. It should be appreciated that the subscriber directory 10, the system control center 20, the message bank 30, the database manager 40 and the transmission sequence 50 compiler are software modules that may be maintained on one or a plurality of separate but interconnected or networked computer systems. Such computer systems can be microcomputers to mainframes. Certain software functions of certain modules may be incorporated into any of the appliances.

[0127] The subscriber directory 10 is a database and maintains records of all system subscribers, i.e., those individual or entities who will receive the messages through the printer appliances 80. The subscriber directory 10 is preferably maintained in a conventional database program such as, for example, Oracle, dBase, Paradox. While flat file database programs may be used, relational databases such as the ones described above are preferred.

[0128] The subscriber directory 10 maintains the serial numbers of all the printer appliances 80 that have been released to the market place. The appliance serial number for such appliances is very significant because it serves as a message destination code or address for directing messages using the system. Through the database manager 40, the serial number can be linked to detailed household information including geographical address and subscriber profile data. The appliance serial number is always printed on all delivered messages. If a message also serves as a discount coupon or other voucher, the identification of the issuing source can be identified upon redemption. This would, for example, enable a promotion sponsor to track the event and obtain information on the respondents for inclusion in his customer database. A printer appliance owner would have the option to deny use of any of his or her personal information for any use for privacy reasons.

[0129] Other data that can be maintained by the subscriber directory 10 includes bibliographic, geographic, demographic, household information, brand preferences, hobbies, spending habits, ailments, and other individual characterizations.

[0130] A sample table illustrating the subscriber directory is shown in FIG. 2 and, includes, for example, information relating to the subscriber's name, address, geographical region, family composition, residence type, income, interests and brand usage. It should, of course, be appreciated that virtually any type of information concerning the subscriber may be maintained depending upon the particular application. Thus, for example, if the subscriber directory is to be used in conjunction with the delivery of appointment reminders, in-

formation concerning the subscriber's patient number, appointment history and insurance information may be maintained.

[0131] The information contained in the subscriber directory 10 can be outputted in print form similar to a regular telephone directory and used by senders in compiling their message lists. A hard-copy directory might be used, for example, in a medical practitioner's office in preparation of a message list to remind patients of their appointments for the coming week. Large-scale users such as utility companies may be allowed secured direct access to the directory or provided with magnetic tape, diskette or ROM forms for assigning serial number addresses to their invoices.

[0132] The subscriber directory 10 potentially has a high commercial value because of the consumer information content and, if desired, may be rented to or shared with manufacturers, direct mail or telephone marketers, per published privacy policies and in accordance with governing laws and proper notification to users.

[0133] The data contained in the subscriber directory 10 is, in a preferred embodiment, maintained in bit-string format which facilitates the ability to sort such data and subsequently match the data to corresponding requirements in the printer appliances 82 upon broadcast.

[0134] A sample of possible bit-string groupings is included in FIG. 3 in which multiple digit numbers are assigned to a particular field and data. For example, bits between 000 and 100 may be assigned to the geography and zip code of the subscriber; bits 101-130 may be assigned to household composition data; bits between 131-160 to the type of home; 161-170 to the family income; 171-200; and above 200 to brand usage, etc. It is anticipated that up to 1000 bits may be used in this regard although this number may be increased or decreased if necessary.

[0135] The system control center 20 may be run on most current CPU's including microcomputers and main frame computers and provides overall management and administration for the entire information delivery system. It is composed of a computer and associated input/output peripherals incorporating software modules that perform functions such as:

- 45 a. Collecting and accepting new system information such as the serial numbers of additional printer appliances, new messages, and new and updated subscriber profile data.
- 50 b. Relaying and entering new information to the appropriate repositories. e.g., new serial numbers to the subscriber directory 10, messages to the message bank 30 and profile information to the database manager 40.
- 55 c. Editing, updating and generally maintaining the subscriber directory 10, message bank 30, and database manager 40.
- d. Providing support to the database manager 40

and transmission sequence compiler 50 in posting and dispatching messages, and tracking sender volumetrics for billing.

[0136] Basic utilities to support the above functions generally exist within the management system of modern database products.

[0137] The message bank 30 is a table in a database of the type such as, for example, Oracle, dBase, Paradox, etc. The message bank 30 serves as a vast repository for collecting and storing messages pending distribution. It would preferably have a highly versatile data reception capability to permit messages to be received electronically, recovered from storage media such as disk, ROM, swipe cards or tape, optically scanned from hard copy by barcode or optical character readers or, as a last resort, entered by keyboard.

[0138] Upon entry into the message bank 30, the messages are stored in table format of the type illustrated in FIG. 4. The message bank 30 contains the date that the message is to be delivered, the priority of delivery (e.g., urgent), the type of message, (e.g., coupon, warning, advertisement, etc.), the text and graphic of the message, the destination criteria (e.g., national, specific subscribers, selected groups of subscribers, etc.) and whether the message needs to be broken into parts due to its length.

[0139] The message bank will, on a daily basis, process those messages that are to be delivered during such day. FIG. 5 illustrates the manner in which a sample batch of message may be processed for a particular day. The messages are initially sorted by the date on which they are to be delivered and then by priority. Thus, all urgent messages (e.g., priority 1) would be delivered before increasingly less urgent messages (e.g., priorities 2-0). Messages of a particular priority, e.g., 1 would be delivered in the order that they were initially received by the system.

[0140] Bits conforming to the bit-string sequence of the subscriber table identify the destination criterion identified in the message bank table. For example, FIG. 6 illustrates the application of the bit-string procedure discussed previously concerning the subscriber bank 10 with reference to a group of messages. Note, in particular, that by using the bit-string procedure heretofore discussed, it is possible to quickly and specifically target a group or groups of individuals. For example, the coupon may be directed to a specific geographical area, a specific type of household and a specific income level by simply identifying the applicable bit-string for the targeted groups.

[0141] The database manager 40 is a sophisticated system, preferably of the Oracle or Informix genre, due to its need to handle multiple databases including the subscriber directory 10, the message bank 30, and schedule the transmission of messages.

[0142] The transmission sequence compiler 50 is a dedicated component with the responsibility for ready-

ing message batches so that they can be relayed to the pager network 70 in a controlled and efficient manner. Required tasks for the transmission sequence compiler 50 include sorting and sub-dividing the daily batch into sub-batches for optimal loading to the different modems and prioritizing within these sub-batches to ensure that the messages within the sub-batches are sequenced in accordance with urgency of delivery requirements. An important priority would be, for example, to ensure that early time-zone messages are queued early in the relay process.

[0143] FIG. 7 is a sample of the format in which a group of messages ready for transmission would be organized and FIG. 8 provides some examples of data that may be contained in such a table. Note that the messages are sorted by priority and then by message sequence number (MSN). The Destination Code String indicates whether the printer appliances are to receive data based on the individual PMA number or, alternatively, on the bit string code. For example, if the message is intended to be processed only by a particular PMA, the identification number of the targeted PMA or PMA's will be indicated. In such manner, the destination Code String would be "0". Note that one or a multiplicity of PMA identification numbers can be provided.

[0144] Where, however, the message is intended to be processed by "groups" of subscribers based on criteria identified in the bit-string codes, the Destination Code String would read "1" or "2" depending upon whether the message was "public" or "private." If public, that is, if it is intended to be an unsecured message, the Destination Code String would be "1" and the Bit Code String would be provided. Thus, if the message was intended to be processed by a particular group of subscribers, the bit-string of such group would be identified in the Bit String Code.

[0145] The system of the present invention has the ability to deliver private, secure messages to be printed on printer appliances containing a "private" key. In this manner, the Destination Code String would read "2" and both the PMA number and a Private Key Number unique to that printer appliance would be transmitted as part of the Destination PMA Code.

[0146] The transmission sequence compiler 50 assigns a unique Message Identification Number ("MIN") to each message for subsequent audit tracking. The MIN number represents that number of the batch in which the message was transmitted, e.g., 00001, followed by the Message Sequence Number and the year. Thus, the MIN for Message Sequence Number 152001 which was transmitted in the first batch in the year 1998 would be "0000115200198". The assignment of such a MIN permits the system to automatically track the transmission of each message delivered to the system. It further serves to facilitate tracking of production efficiency, volumetrics, and quality control measures.

[0147] The bank of modems 60 is the primary channel for telecommunication messages to the pager network

70. Conventional off-the-shelf modems such as, for example those provided by U.S. Robotics, Hayes or other conventional modems may be used. The capabilities of everyday modems are improving rapidly with standard transmission rates currently at least 56 KB. The bank of modems may be replaced by a dedicated cable TV link as the system grows.

[0148] Batches of messages from the sequence compiler 50 are telecommunicated by the message bank to the wireless pager network 70 by regular modem-modem interconnection. Such communications are buffered at the network head-end and broadcast as traffic permits. They may be maintained by the network in buffer storage and then transmitted in batches along with other messages or interleaved between other messages. This permits more efficient and convenient transmission and at lower costs than transmission at peak rates.

[0149] In certain applications, it may be necessary to install a dedicated traffic monitor, with message storage and retrieval modules, between the bank of modems 60 and wireless pager network 70. This utility is intended to efficiently integrate the high volume of lengthy print messages into the regular, pager transmission activity.

[0150] Major providers of pager networks are PageNet, SkyTel, ComCast and others. In addition to the foregoing, there are a host of regional pager networks including, for example, Page 2000 by the Southern New England Telephone Company.

[0151] It should, of course, be appreciated that the pager network system may constitute virtually any form of wireless broadcast or narrowcast system now known or developed in the future.

[0152] In a typical pager network, the messages are transmitted by the modem bank 60 to the wireless pager network 70 where they are amplified and transmitted to a teleport for uplink to the receiving satellite receiver. The messages are then re-broadcast to a plurality of receiver/retransmitter towers which, again, amplify the signals and re-transmit the messages to the network of printer appliances 80.

[0153] The network of printer appliances 80 consists of a plurality of individual printer appliances 82, each having a unique serial number for identification purposes. These appliances include normal pager components and circuitry, combined with a thermal printer and enclosed in a case with a lid allowing easy access for paper placement.

[0154] A possible rendition of a printer appliance 82 is illustrated in FIG. 10 and a flow diagram of the function of the printer appliance 82 is shown in FIG. 11.

[0155] The printer appliance 82 includes a ferrite core antenna 83, a receiver 84, a decoder 85, filter or format generator 86, microprocessor 87 including random access memory 87A, write only memory 87B and an EPROM 87C, a power supply 88 and a printer 89, preferably of the thermal type although, in future years as the prices come down, it may be possible to use ink-jet or other computer type printers.

[0156] It is preferred that the thermal paper be stored in a fan-folded manner rather than a spool or roll although it should be appreciated that a spool or roll may be utilized in some applications. The use of fan-fold pa-

5 per enhances the design efficiency of the unit. Fan-fold paper provides higher residual paper storage density than roll paper. In addition, by perforating the paper, it facilitates separation of the message paper slips. It also folds and lays flat on delivery with minimal curing that is
10 a serious problem with spooled thermal paper. Since the messages to be delivered using the information delivery system of the present invention are fixed format messages, such formats lend themselves to the use of fan-fold paper.

15 [0157] In a preferred embodiment, the receiver 84 of the printer appliance 82 is a standard pager receiver POCSAG Format, 2400 Baud and the decoder 85 is an off-the shelf POCSAG unit. Other formats than can be used include FLEX and GOLAY. The use of the FLEX format would provide a significant advantage in terms of providing back channel capability for message reception confirmation and is also much more power efficient than the POCSAG format.

20 [0158] A destination code eligibility-filter 86 and a basic microprocessor 87, preferably an 8301 or 8051 chip, are also included in the preferred embodiment. 1 Kbytes of RAM 87A is typically sufficient along with at least 128 bytes of EPROM 87B. The incorporation of write-only memory 87B is important to permit storage of the subscriber bit string eligibility filter, allowing subsequent matching with the messages being transmitted. In addition, a conventional consumer appliance type power supply 88 is preferred.

25 [0159] It should be appreciated that printers draw considerable wattage so that there is need for a dedicated power supply 88. Such a power supply 88 would preferably be a stand-alone module due to design and operation restrictions as well as economics. The main unit would be fitted with an LED power-on indicator 90 as
30 shown in FIG. 10 so that a user may quickly see that the appliance is in an active mode.

[0160] The printer appliance 82 utilizes established POGSAG technology that is sufficient for most applications. Future versions of the appliance may incorporate 35 a Motorola Flex receiver/decoders if improvements in performance criteria or economics become more attractive or are required. Most of the other components such as the 8051 processor, RAM and EPROM are mass produced devices available at low cost.

40 [0161] The components of the printer appliance 82 represent the initial preferred embodiment of such device. The printer appliance 82 has inherent processing capabilities beyond simply providing the basic tasks. With additional components and control software, extended functionality can be readily incorporated.

45 [0162] The printer appliance 82 may also include, for example, an RS232 port (not shown) to permit transfer of messages to or from an auxiliary system such as a

personal organizer, a laptop or desktop computer. Reminder type messages are an obvious candidate for organizer entry. Relay to a personal computer permits messages to be archived, reformatted and the likes as well as offering a host of other print options. It should be appreciated that the printer appliance may also be upgraded to render it compatible with a cable television delivery system of messages such as the one, for example, described in United States 5,500,681 which is issued on March 19, 1996 to Charles P. Jones for Apparatus and Method for Generating Coupons in Response to Televised Offers, the disclosure of which is hereby incorporated herein by reference thereto.

[0163] Similarly, the incorporation of an input port would permit the printer appliance to function as a utility printer to print, for example, e-mail messages thereby rendering the printer appliance 82 a centralized message source.

[0164] The incorporation of an IR port (not shown) may also be of particular interest because it may be addressed by an intelligent remote control. See, for example, U.S. Patent No. 5,500,681 that describes a method for transmitting promotional messages via cable television. Alternatively an intelligent remote control may also capture and store the coupon image and, at the user's convenience, be linked via an IR port to the printer appliance to print the coupon message. Communication between the intelligent remote and the printer appliance may also be accomplished through a RF link.

[0165] Incorporation of a display 90 for the printer appliance 82, preferably a LCD, may also serve to facilitate the user interface. It may, for example, flash urgent messages, allow the user to scroll and review messages and provide prompts for error conditions. With additional memory and software upgrades, the recipient may have the choice of visually reviewing the message and selectively printing only those messages that it selected in much the same manner they currently choose which e-mail messages to print.

[0166] As a transfer medium, the inclusion of a magnetic stripe or smartcard reader/writer (not shown) into or as an optional attachment to the printer appliance 82 would also allow portability of the stored message, with subsequent printing done at the user's convenience. It is possible that, for example in the case of discount coupon messages, printers would be available at the retail establishment where the purchase is to be made. Apart from the portability aspect, limiting printing to only specifically authorized printers may add another layer of security to the process. In future generations of the system, it is possible that coupon messages would never have to exist in print form. Discount coupons stored on the transfer media may be read at the store checkout station or at an in-store kiosk or display incorporating the appliance and the card reader/writer attachment and the savings applied if the appropriate purchase was made.

[0167] In addition, confirmation means (not shown)

can be incorporated into the printer appliance 82. In conventional paging network systems using POCSAG technology, there is no back-channel capability. Thus, the broadcaster does not receive any confirmation that the message has actually been delivered. In order to increase the reception probability, it is common to employ a redundancy process where repeat message packets are transmitted at different time intervals, but only printing from any printer appliance a single time.

5 [0168] Each message may be transmitted 2 or 3 times over a course of minutes to insure that they are received. The PMA is able to identify duplicate transmissions and reject the redundant transmission. The receiver has in-built sensing capabilities and ignores repeat receptions.

10 [0169] This methodology has worked exceedingly well and will accommodate the vast majority of messages. Reception confirmation may be an issue in those cases where the message has a significant monetary value, as for airline or event tickets.

15 [0170] Skytel has recently introduced a paging service that guarantees message reception and does incorporate back channel, confirmation capability. Their system is based on a new Flex component that does have response capability. Prior to actual message transmission,

20 the particular receiver is polled by the network to determine whether the unit is in an active mode. If a "ready and able" response is echoed, the message is relayed repeatedly until the "AOK" reception confirmation is returned. This modem technology may be utilized

25 when the underlying economics are more favorable for deployment in a high volume consumer appliance.

30 [0171] The entire system is practical and economically viable only if a vast number of printer appliances 82 are installed. Factors that will influence mass acceptance are price, design appeal, available distribution channels, ease of use, minimal user responsibility, and ready message display. While the individual appliances 82 can be of a "basic" nature, as use increases there are many opportunities to add additional functions and features and, possibly, integrate the stand alone appliance into other common household appliances, e.g., radios, televisions, refrigerators, clocks, door chimes, and other popular home electronics.

35 [0172] While the system of the present invention is designed to operate in a continuous message-dispatching mode, it is much more efficient if messages are handled in a batch mode. In this manner, a batch would consist of all messages that were due for delivery on any particular day. These daily batches would be transmitted

40 during the late hours of the prior day and early hours of

45 the due date to take advantage of the low network traffic conditions that exist during sleeping hours.

50 [0173] A unique feature of the system of the present invention resides in the security features of the system, which are intended to prevent fraud and counterfeiting. While some messages contain only information, others such as coupons or tickets have a defined monetary value and are likely candidates for fraud through unauthor-

ized duplication. The present system employs at least five reproduction inhibition techniques: (1) chemically treated paper; (2) color printed edges; (3) reverse side printing; (4) incorporation of a high-resolution pattern; and (5) serial number printing.

[0173] In this regard, the printer appliances 82 may employ special, coated thermal paper having a production identification so as to verify the paper source. Similarly, pre-printed color edges may be used on the paper to require color-replicating equipment for duplication. Specific markings may also be printed on the reverse side of the paper that can be automatically sensed using opto-electronic means which can not only assist in alerting the recipient that the appliance is out of paper or there is a paper jam but, also, will serve as a deterrent to unauthorized duplication.

[0174] Other deterrents that can be employed to prevent counterfeiting include the incorporation of a high-resolution pattern on the reverse side of the paper. Thus, reproduction may only be accomplished with sophisticated and expensive copy equipment. Finally, the printer appliance 82 would print its serial number on every outputted message which, in addition to providing a unique trace to origin, would serve as a further deterrent to counterfeiting since it is a declaration of identity. In the event that any replication activity was even suspected, a serial number erasure message may be transmitted to immediately disable the particular printer appliance. Alternatively, messages to a specific printer appliance may be eliminated by the system control center 20 or by a flag or field set into the subscriber directory 10 or even in the database manager 40.

[0175] With reference to FIG. 1, operation of the information delivery system of the present invention is as follows. The subscriber directory 10 would include the most relevant and current data for a given subscriber. As previously noted, the subscriber directory 10 would include all applicable bibliographic, demographic and user-characteristic information. It may also contain, for example, telephone numbers, health code numbers, social security numbers and other unique numbers that will facilitate the coordination of a PMA serial number to a particular individual or individuals. It is anticipated that the information in the subscriber directory 10 would be updated on a regular basis as new members are added or deleted and as the information relating to a particular member changes. Such data can be inputted either manually or electronically.

[0176] It should be noted that for ease of distribution, it is advisable to assign bit-strings to the data contained for a particular subscriber. In this manner, messages can be broadcast for processing only by one or a number of specific appliances or, alternatively, by those appliances that have characteristics that match the criteria in the message. The use of bit-strings substantially reduces the amount of data that needs to be processed by the system when determining the potential recipients of a particular message.

[0177] Simultaneously, messages that are to be delivered are inputted into the message bank 30 with specific information concerning the message and delivery instructions, e.g., intended recipients, priority, time and date of delivery, etc.

[0178] Upon entry of the appropriate message or messages into the message bank 30 and the subscriber information into the subscription directory 10, the system control center 20 and the database manager 40 then reviews all messages stored in the message bank 30 and segregates them based on the date or dates on which they are to be delivered. Those messages that are to be delivered on a particular date would be identified and segregated. A sample batch of typical messages to be delivered on a particular date is illustrated in FIG. 5.

[0179] The database manager 40 then assigns bit-string destination codes for the data contained in the batch of messages using the criteria previously identified in FIG. 6.

[0180] The message is then formatted by the inclusion of detailed text and graphics if so instructed. It is contemplated that the database manager 40 will include a vast store of graphic templates such as, for example, prior coupon images, invoice and appointment reminder layouts, logos, simple product pictures, clip-art and a wide variety of text fonts. The database manager 40 would also incorporate a dedicated publisher module with access to the template files and a general capability for semi-automatically designing the printed-message layout. The publisher module would assist in the generation of publisher quality material and would include standards logos, clipart and photographs that would be included in the message. In this manner, the message may simply reference a logo or piece of artwork contained in the publisher module that would then substitute the stored artwork or photographs for incorporation into the message.

[0181] In the case of manufacturer discount coupons, the industry guidelines require that the coupon be bar-coded using a standard UPC Coupon Code format which permits a retailer to automatically scan the coupon at the checkout register. Basic code information identifies the issuing manufacturer, classifies product type with a group family code, and denotes the coupon value. An appendix code has recently been endorsed in UPC/EAN format that can carry additional information such as offer number, expiration date and household identification. The publisher may include a subsystem that would automatically generate the numbers for the bar codes and embed them in the coupon message.

[0182] Prior to release for relay, the message images might require some manual editing in order to optimize the esthetic presentation of the image.

[0183] The compiler 50 then compiles all applicable messages for a particular date, puts them in priority order and then readies them for broadcast.

[0184] Where a specific message such as, for exam-

ple, a message reminder, is to be transmitted to a single appliance, the message would include the specific serial number of the appliance to which the message is to be directed. Similarly, where messages are to be distributed to all appliances, the message would include a default number common to all active appliances, e.g., 99999.

[0185] When messages are to be delivered to a profiled group of recipients, the Database Manager 40 would search the database, extract subscribers from the Subscriber Directory 10 matching the specific profile criteria, and then extract the serial numbers of the appropriate appliances from the Subscriber Directory for dissemination to such appliances. It is also possible, especially in the case of promotion or advertising messages that the sender will want delivery to as many recipients as can be reached on his particular roster. This would require that the Database Manager 40 to overlay the customer roster with the Subscriber Directory 10, and extract those serial numbers of the common entries.

[0186] Similarly, where the message is to be delivered to a group of subscribers, the bit-string code described above would be part of the message transmitted.

[0187] The final process in preparing the daily batch for transmission requires that the transmission sequence compiler 50 in FIG. 1 serializes the message code strings in a priority sequence as determined by delivery urgency. Some messages must be delivered the next day, while others may be carried over to the following day without difficulty. This allows for accommodation if the system becomes capacity stressed or slowed by high network traffic. The daily batch would actually be subdivided before sequence so that the smaller batches may be dispersed amongst many modems and messages and relayed in parallel to the head-end of the pager network 70. Messages will then likely be broadcast by the pager wireless pager network 70 within the normal pager frequency band of 929-932 MHz along with other regular paging message activity.

[0188] Messages are then received by all of the printer appliances 82 in the appliance network 80. Functionally the printer appliance 82 operates as follows:

1. The broadcast messages are sensed by the antenna 83 and fed to the receiver 84.
2. The message signal is then pre-amplified and decoded in the CPU.
3. Message acceptance is achieved by the CPU 87 performing a software, password-matching processes. Each particular appliance has at least four levels of passwords, namely: (1) the default appliance serial number (all "9's" to accept and process national messages); (2) the specific appliance serial number (a unique number assigned to each individual appliance); (3) a bit-string eligibility code number (which is derived from the profile of the subscriber); and (4) the private PIN number as defined by the subscriber (for processing of highly secure

messages). Each message is codes with one or more of the aforesaid numbers

4. RAM memory 87A is needed by the CPU 87 for performing multiple tasks including, for example, system management, message handling, destination code matching, bar code generation and the like. EPROM 87C would store security information, and in particular the appliance serial number. Information concerning the characteristics of the subscriber would be stored in the write-only memory 87B to protect against loss during a power failure.

[0189] FIG. 12 illustrates the critical, message eligibility process that the CPU in the local printer appliance 82 must perform. To determine whether a message is being addressed to a particular printer appliance 82; the CPU interrogates the destination code header. If the Destination Code String is "0" indicating that the message may only be processed by a specific printer appliance or appliances, it then determines whether there is a match with the PMA number being transmitted with that of the appliance. If there is a match, the message is processed. If not, the process is aborted.

[0190] Similarly, if the Destination Code String is "1" indicating that only appliances with a particular bit-string code may process the messages, it then compares the bit-string of the appliance with that of the message. If there is a match to all or a predetermined percentage, the message is then passed on for processing. If there is no match, the process is aborted.

[0191] Lastly, if the Destination Code String is "2" indicating that the message is being transmitted to a specific appliance or appliances having a private key, it looks to match the PMA number of the message with that of the appliance. Standard encryption techniques used in RSA and PGP use a public key/private key encryption. An algorithm in the PMA will decrypt the message, process the decrypted message and print it out. It can only be decrypted by the PMA with the private key.

[0192] FIGS 13 and 14 illustrate a particular sample of bit-string matching between the destination bit-strings contained within the broadcast message and the eligibility bit-string code number contained in the appliance. Note that there needs to be a complete match between the destination bit-string contained in the message and the bit-string of the appliance. In certain situations, it may be feasible to permit the appliance to process a message where only a predetermined percentage of the bit-strings are matched, e.g., at least 25%.

[0193] FIG 15 illustrates the manner in which messages within the appliance may be processed and eventually printed using a message interpretation process. Incoming messages will typically be received in a highly

condensed form as the Sequence Compiler has adopted compaction processes such as zipping, zero compression, bit packing and general data compression. The CPU must then decode and decompress the message content.

[0194] As previously discussed, in order for a Pager-Network provider to handle the message in a normal manner, the message must be contained within a specified packet length or, alternatively, will be packetized over multiple packets. Some messages, particularly coupons, will include significant graphic content and the total message may have to be transmitted in the form of a packet series. This necessitates inclusion of a pre-content header indicating the number of parts to the message. A byte indicator packet, for example 1 of 3, would serve to alert the system that the message is not complete until all three parts have been received and that the CPU will need to merge the packet contents and reconstruct the total page prior to generating print code.

[0195] A particular application of the subject invention involves using the wireless system to broadcast coupons to an array of in-store receiver-printer-dispenser units. FIG. 16 illustrates such a coupon distribution system, in which the components are described as: (1) reservation system 100, (2) promotion control center 110, (3) graphics design module 120, (4) modems 130, (5) pager network (140) and (6) in-store arrays of receiver-printer-dispenser units 150. It should be appreciated that the reservation system 100 corresponds to the message bank 30, the modems 130 correspond to the bank of modems 60, the pager network 140 corresponds to the wireless pager network 70 and the in-store arrays of receiver-printer-dispenser units correspond to the network of printer appliances 80. The promotion control center 110 incorporates the system control center 20, subscriber directory 10, database manager 40 and transmission sequence compiler 50. The addition of the separate graphics design module 120 is designed to facilitate the incorporation of graphical images into the coupons generated by the system.

[0196] The in-store array of receiver-printer-dispenser units 150 consists of a plurality of individual receiver-printer-dispenser (RPD) units 151, each having a unique serial number for identification purposes. A flow diagram of the function of the RPD units 151 is shown in FIG. 17.

[0197] The RPD unit 151 includes a ferrite core antenna 152, a receiver 153, a decoder 154, format generator 155, a reprint sensor 156, microprocessor 157 including random access memory 157A, flash memory 157B and an EPROM 157C, a power supply 158 and a printer 159. The functionality of the RPD unit 151 is significantly enhanced by the addition of the flash memory 157B and the reprint sensor 156, as well as by the addition of a visual display 166, audio component 168 and motion detector (not shown). On the assigned distribution date, the promotion control center 110 codes the detailed offer information into a format compatible with

pager network 140 transmission requirements. These coded signals are relayed to the pager network 140 via a modems 130. In turn, the pager network 140 broadcasts the coupon offer signals which are detected by the

5 RPD units 150 arranged in various configurations within a store. The antenna 152 senses the coupon signal as broadcast by the pager network 140. A receiver 153, such as a Motorola POCSAG demodulates and amplifies this signal and relays it to the decoder 154 and format generator 155 so that the coupon can be printed. The coupon signal is also stored in flash memory 157B for later printing. An emitter-detector pair in the reprint sensor 156 detects removal of a coupon and orders a fresh coupon to be printed from the originally transmitted image as stored in flash memory 157B. This action would also activate a counter so that the volume of coupons distributed can be recorded.

[0198] The E-Prom 157C contains a unique serial number identifying each individual RPD unit 151. Every 20 transmitted message has a destination header containing the serial number of the particular RPD unit 151 eligible to receive the message. A matching operation is performed prior to full decoding to determine whether an incoming message is eligible for printing.

[0199] A schematic of a basic RPD unit 151 is shown 25 in FIG. 18, and an illustration of a typical shelf RPD unit 151 is shown in FIG. 19. In the preferred embodiment, the physical dimensions of the RPD unit 151 are 8 inches high by 4 wide and 2 inches deep. Such dimensions 30 allow the RPD unit 151 to be placed on a display shelf without obstructing the products unnecessarily, while still being large enough to be visible to a consumer and to print coupons. The RPD unit 151 may include a paper loader 160 for insertion of the paper that coupons 162 are printed upon. A status indicator 164 may consist of an LED that lights when the RPD unit 151 is active or flashes when there is an internal error. In the basic RPD unit 151 shown in FIG. 18, the reprint sensor 156 is of the form of an LED emitter/silicon detector pair.

[0200] The RPD unit 151 may also be fitted with a display 166 for the display of a visual message appropriate 35 for the product or coupon 162, as well as a speaker module 168 for the broadcast of an audio message relative thereto. The display 166 may include any type of electro-optical signage such LED, LCD, Plasma or CRT, depending upon configuration of the RPD unit 151 and its location in the store. LED or LCD may be more appropriate for smaller configurations such as bulletin boards or shelf units while Plasma or CRT would be more suitable for bigger kiosk or end-cap configurations. The 40 speaker module 168 is composed of a dedicated receiver, controller, voice-chip, speaker and a motion sensor (not shown). As a potential customer comes within range of the coupon dispenser, the motion detector 45 would activate the audio message in order to entice a customer to take the coupon.

[0201] The RPD units 151 can be arranged in a variety 50 of configurations such as bulletin boards, wall displays,

entry kiosks, end of aisle stands and shelf displays. The configuration of the RPD units 151 are detailed in a store layout plan in which each array configuration is designated by type, position in the store, and the serial number of each RPD unit in each array.

[0202] A bulletin board dispenser 170 is illustrated in FIG. 20. This configuration is composed of multiple RPD units 151 assembled on a plug-in board 172 with a large display module 174. The display module 174 may be an LCD or LED display controlled by display controller 176. The bulletin board dispenser 170 may also include an audio module with speakers 178. The display module 174, audio module 178 and RPD units 151 would all be provided power by power supply modules 179.

[0203] Figure 21 through 24 illustrate various other configurations for the RPD units 151 in store displays. In all the configurations, visual and audio displays could be incorporated to create further interest. Figure 21 shows an end-cap dispensers 180 configuration wherein in an array of RPD units 151 are arranged to attract attention and provide easy accessibility to the dispensed coupons. Figure 22 depicts a booth or kiosk display 182 with an array of RPD units 151. Figure 24 is a sample floor plan showing a variety of different RPD unit 151 displays, including booth displays 182, end-cap dispensers 180, shelf dispensers 184 and bulletin board dispensers 170.

[0204] In an alternate embodiment of the current invention, the RPD units 151 may be programmed locally by a store operator to add promotions directly. Such a facility enables the retailer to run his own promotions on RPD units 151 scheduled for this purpose. The local load out could be done via the pager network or, alternatively, through a dedicated loading module.

[0205] In yet another embodiment of the current invention, software is provided for entering and encoding promotions directly. The software would be installed on the store computer and relay of the promotion would occur via modem to the pager network and on to the addressed RPD units 151. Alternatively, this software could be installed on a computer at the retailer headquarters which could then control all retail promotions for the complete store/chain roster. This adaptation at the store or headquarters could also be used to interface or integrate the current invention with an in-store loyalty program. Or, this adaptation of the current invention could be used for sending secure/confidential messages throughout the chain or to individual stores. Secure messages in a store environment may include reports, summaries, and individual, unique store communications.

[0206] In still another alternate embodiment, a dedicated piece of hardware including a central processing unit, keyboard, display, memory and a local RF transmitter emulating a normal pager network signal may be used by an operator to configure and address any particular RPD unit 151 and enter a desired promotion.

[0207] It should be appreciated that the RPD units 151

need not be limited to printing coupons. For example, the RPD units 151 could also serve as a dynamic dispenser of rebate claim forms, surveys, contest announcements and entries, sweepstakes entries etc. or any other often-requested forms or printed matter.

[0208] FIG. 26 through 31 illustrate a number of different but related methods for distributing coupons which are first displayed to and selected by consumers over the Internet. In the first method illustrated in FIG. 26, instantly redeemable paper coupons are viewed by consumers over the Internet and then delivered directly to the homes of the consumers either directly on the computer printers or using their Coupon Direct PMA 82.

[0209] In the second method, after selection of the Internet coupons, the consumer can print a list of the offers selected on any type of printer along with a uniquely identifiable validation number for redemption in a retail establishment. The validation number can even be hand-written while viewing the monitor, or information on the screen can be printed.

[0210] This list is not redeemable, and has no monetary value until the offer(s) are validated at an automated control station or "validator" within the store. Once validated, the control station or validator would issue the coupon in either electronic or paper format which would be applied when the consumer made the qualifying purchase.

[0211] FIG. 26 is a flow chart of the first method in which the coupons are delivered directly to the consumer. Manufacturers, such as Kellogg, Kraft Foods, Lever Bros., etc. or other large national/regional retailers 110 would release coupon offers to an Internet distribution site or distributor 112. The distribution sites 112, such as Cool Savings, Meals.Com, Supermarkets Online, etc., would design and electronically publish these promotions according to manufacturer specifications. On attraction to the Internet site, the visitors would be presented with a menu of offers of different coupons and they would be free to choose those of particular interest.

[0212] Before the release of the promotion, the text and/or graphical formats of each coupon would be relayed from the Internet site computer/server by means of any variety of communications methods, both wired and wireless, however it is envisioned that the initial communications would be via modem to the front end of a control center 120 in the CouponDirect distribution system. Alternatively, the coupons could be downloaded directly to the consumer's computer 115 for printing using its own computer printer. The printer can print either a secure coupon containing some of the anti-fraud features that will be described herein.

[0213] Consumer product usage information will be captured in normal redemption processing, extracted and formatted, then communicated electronically back to the CouponDirect database manager 40, and the subscriber directory 10, for subsequent targeting of individuals and groups of users via bit-string coding.

[0214] The control center 120 has a file matching ca-

pability which includes any or all of the following features: e-mail addresses, printer identification numbers, owner's name, a password or PIN, etc., with the appropriate Coupon Direct printer. Appropriate destination codes and unique sequence numbers, are assigned to the e-mail choices and the selected coupon formats are transmitted by modem to the pager network 125. The control center 120 maintains a security log that allows full traceability for the coupon issuance including time, date, e-mail address, offer and sequence number.

[0214] The pager network 125 broadcasts coupon offer information to one or more Coupon Direct PMA's 82 which receive and interpret the transmission in the form of a text and/or graphical coupon image. The PMA 82 then prints the coupon 130 on highly secure, anti-fraud paper stock. The consumer can then redeem the coupon 130 in a traditional manner at a retail establishment 140. This system distributes coupons in very controllable volume, with each individual coupon uniquely traceable.

[0215] The coupons printed by these PMA's 82 preferably include one or more anti-fraud features to eliminate or at least reduce the possibility of fraudulent redemption. As shown, for example, in FIG. 27, the printed coupons may include some or all of the following features to prevent fraud: preprinted red ink borders; light background logo printing; a red ink fraud message on the back of the coupon; a unique sequence number enabling full traceability; a distinctive perforation pattern; a resolution symbol that would blur on copying; and the use of special, chemically treated paper permitting ease of detection by heat, light, etc.

[0216] It is contemplated that the general appearance of the coupon would be very similar to the thermal printer type, as issued by Catalina at checkout lanes. Catalina has not, however, found a need to incorporate many of the antifraud devices discussed above.

[0217] This method is very workable but there are some limitations in terms of audience reach, because of the requirement that a potential user must own a Coupon Direct printer appliance 82.

[0218] Similarly, the coupons can be delivered on an in-store basis using a version of the method described above which is illustrated in FIG. 28. In a similar manner, the manufacturer 210 releases notices containing detailed specifications of the coupon offers to a web site distributor 212. The web site distributor 212 then formats the offer graphics and integrates them into appealing screen presentations. Several screens full of a wide range of offers are usually available.

[0219] Upon viewing the site through a remote interactive PC 215, the consumer makes his selections from a list of possible coupons that are of interest. The selection list information is relayed back to the web site 212 along with an identifying e-mail address. The web site then returns a list describing and summarizing the selected offers. Each coupon offer on the list is assigned a numeric validation code. The list can be

printed off the PC 215 using any printer and any paper stock. An example of a list as presented on the monitor and subsequently printed, is shown in FIG. 29 which includes the date of the list, some personalized message, descriptions of the product type, discount amount or value, expiration date of the coupon offer and a validation code. The validation code will become the vehicle for the consumer actually obtaining the coupon.

[0220] Although desirable, it should be appreciated that a formally printed list is not required. A consumer can hand-write the offer and validation codes and, perhaps, adds this basic information to a regular shopping list. This is important because offers can now reach an extensive, additional audience of laptop PC users who usually do not have ready access to a printer. Again, all that is important is the particular validation code.

[0221] The offer list 218 and e-mail address identifier are then relayed from the web site 212 to the front end of the Coupon Direct control center 220. Here, an information packet is composed of the destination codes that identify the in-store validation terminals that must be contacted, the text and graphics information pertinent to all of the chosen offers, and the unique order validation numbers as assigned to each order or consolidated group of orders containing the consumer's selections.

[0222] These information packets are then sent by modem to a pager network and subsequently broadcast to a series of enhanced CouponDirect printer appliances PMA's 282 which also serve as "order validators" of the coupon. These order validators 282 sense the incoming signal, powers-up from a standby mode, and begin interpreting the message. If the destination codes are not consistent with a filter contained in the validator 282, the packet is ignored. If there is a match, the order validator 282 decodes and formats the entire information packet. Upon completion of this process, the coupon text and image details and associated validation numbers are stored in a memory bank of the order validator 282.

[0223] The consumer would then take the offer validation list to the order validator terminal 230, which may be stand alone or integrated with an existing display, equipment kiosk, endcap or similar installation located for convenient access at the retail location of their choice. The order validator then prints and issues modified traditional paper coupons that can be redeemed by the consumer at the checkout 240.

[0224] The order validator can also function in an electronic mode whereby the validated offers are relayed to the store computer and then out to the checkout lanes. In this case, a memory-jogging printout, such as a shopping list for products associated with the offers, is presented to the customer. This printout is essentially a condensed version of the selection list shown in FIG. 27. Of course, this list would only present offers that had been validated and issued. This list is constructed within the order validator by associating the validation number with the appropriate selections.

[0225] The consumer would then shop the store and receive discounts for qualifying purchases at the checkout lane through either the manual redemption of a paper coupon or, alternatively, by a transparent system in the case of an electronic offer.

[0226] As an alternative to this approach, the consumer can receive the order validation number through their home computer, take these numbers to the retail establishment, key the order validation number into an entry keypad terminal 250 linked to the order validator 282 and then process the coupon request in essentially the same manner as described above.

[0227] FIG. 30 depicts the operation of the in-store order validator 282. It will be appreciated that many of the components of the validator 282 are similar in function to those of the regular CouponDirect appliance 82. Significant enhancements are, however, necessary to accommodate increased demand in volume. For example, a multiple tap power supply 283 is used to provide the requisite voltages and amperages to drive the printer motor, the thermal print head and signal level, chip components. Similarly, the microprocessor 284 must have performance characteristics approximately equivalent to that of an Intel 386 chip possibly even more.

[0228] The pager receiver 290 performs a normal type CouponDirect function, but may be upgraded to a digital, receive and send module which are now in common use in the pager world. This adds greater versatility to the system, particularly with the remote polling capability. Status of the order validator can be checked at will. Remote maintenance is possible and offer distribution detail can be captured directly from each individual order validator. This upgrade is entirely feasible because cost constraints are much less constrictive in this application than in the case of the CouponDirect PMA 82.

[0229] A simple, calculator-like, numeric keypad 250 is provided containing sufficiently large keys for easy entry. The keypad 250 must also have industrial grade, operating characteristics. Multiple keypads 250 may be used to allow several consumers access at the same time.

[0230] A regular thermal printer 286 is provided although it may be replaced with faster inkjet or laser printers. A display 287 is necessary for operator feedback. In this regard, a small CRT of the type used in conjunction with an ATM machine would be suitable but other options such as LCD's or LED arrays are also possible. A memory bank 288 is provided and contains about 1 megabyte of RAM and secondary storage in the 20-50 Megabyte range. This would allow local retention of a large library of coupon templates and text fonts. This level of storage capacity should also adequately cope with bar coding, remote maintenance operations and data uploads.

[0231] The order validator 282 further may include a modem 289 for communication purposes which is required for operation in the electronic coupon mode. The modem 289 is able to dial the in-store computer to up-

load the validated coupon information. A conventional 56 Kbytes version of the validator 282 should be more than adequate.

[0232] It will be appreciated that while the CouponDirect pager network is the preferred form of distribution of the coupons and validation codes, other communication methods can be used including, for example, wireless, hard wire, fiber optics, infrared, etc.

[0233] It has been found that certain advantages are offered when the order validator in-store system is linked to an ATM machine. The order validators 282 can be either linked to such ATM machines or even fully integrated into these machines. Such links offer numerous advantages to the customers in terms of convenience of use.

[0234] Important characteristics of these two methods described above are summarized in FIG. 31. The Coupon used by Supermarkets Online Web Bucks was used as a baseline for reference purposes. Despite being complex and expensive, it has imparted some security in an otherwise completely open area.

[0235] With respect to the question of reach, all methods require the addition of special devices and equipment. Implementation of the Catalina platform is still in the \$10,000+ range. The Web Bucks system includes a low cost incremental feature that can be added at very modest cost. Reach is obviously limited by installation of the base platform.

[0236] In contrast, the in-store order validator system of the present invention has a headend common to any offer-administration/pager-network addressing system. Beyond that, a simple validator may cost as little as \$200 and one with enabling electronic clearing perhaps \$250. These low start-up costs extend the reach of the validator to many retailers that cannot be economically reached by the Catalina base platform.

[0237] The CouponDirect link system requires a headend similar to the Validator. Thereafter, reach is limited only by selling constraints in getting a S35 appliance into the home.

[0238] With respect to the issue of reception, all approaches obviously require base reception capabilities such as an Internet active PC. The Web Bucks system has virtually no control over in-home printing since any printer utilizing virtually any paper can be used. Common offer coupons, which are normally identical, can look radically different in different sizes, paper stock, ink type, character resolution, etc. This will certainly entail more interpretation at checkout as coupon terms and conditions are resolved. The combination, varieties of printer type, resolution, ink and stock can only result in lower bar code quality and increased non-scans creating further problems at checkout.

[0239] The CouponDirect link system resolves the above issues completely. Although the potential user must have access to a unit, the actual computer used could be an office machine or even a laptop. A coupon could be selected at the office or on the road and deliv-

ered to the home based appliance.

[0240] Similar considerations apply to the in-store validator system with the added advantage that a printer is not even essential. A hand-written copy of the validation codes is sufficient to obtain an endorsed coupon.

[0241] With respect to retailer platforms, these issues are addressed above. The Catalina system interfaces with the store operating system and monitors every purchase at every checkout lane. Some retailer systems barely cope with existing register functions and adding the Web Bucks functions may be difficult.

[0242] The CouponDirect link system does not need a retailer platform and implementation would be transparent to the retailer. An in-store device is required for the method employing the validator system, but it is not intrusive of the store system.

[0243] Response cost is an important consideration. Access cost to the web site is minimal for the Web Bucks system since it is a round-trip Internet routine. There will likely be some frustration involved in awaiting the coupon printout because of the time consumed in file downloads and graphic formatting even with modern 56k/byte modems.

[0244] The CouponDirect link system uses the same round-trip Internet connection as the Web Bucks system but it is not encumbered by time consuming downloads and printing. An immediate confirmation of issuance is given to the consumer with an active appliance and assurance that the coupon will be delivered shortly. The web site relays the issuance information to the headend and the coupon is delivered through a pager call.

[0245] With the in-store order validator system, accessing is similar to the CouponDirect link system, but the pager call volume is drastically reduced. Graphics are only relayed once upon issuance of the promotion and validations are group messages conveyed to a single order validator. A typical retailer may have 5000 potential customers within its local area. Even in the event that all customers select the offer, although significantly less than 5000 pager calls would be needed for contact using this method it would still require far many more than the one single long distance that call would be needed for the method using the order validator. Additionally, the size of each packet (length of each call) would be reduced significantly using the order validator method. Lastly, redundancy of calls, to ensure reception, is reduced.

[0246] The issue of store contact cost does not apply when considering the CouponDirect link system. The Web Bucks system is an incremental activity on the Catalina telephone network and, as such, is difficult to cost. The in-store order validator system has low contact costs since it uses the pager network. The contact costs are similar to the Web Bucks system with the advantage that the pager net broadcast method allows for contact to many units with a common message. Telephone contact is necessarily a number to number, serial process so that the method employing the order validator has a

much simpler interface requirement than the Web Bucks system. The contact cycle is simpler as well since it does not need the secondary processes involved in issuing and subsequently, redeeming, Web Bucks.

5 [0247] The issue of electronic clearing is one area where the in store order validator system has a clear advantage because it can be easily converted to a pure electronic coupon that may be destroyed at the register. In contrast, Web Bucks transactions are more complex.

10 Although the coupon dies at the register, accounting processes in maintaining individual customer Web Bucks credit accounts and balancing earn/redeem activity can be quite complicated.

15 [0248] FIG. 34 illustrates one process of distributing smart card promotions to consumers. The manufacturer authorizes and establishes the issuance of promotions 110, for which the terms and conditions of specific promotions 112 are detailed and forwarded to coupon distributors 114 and participating retailers 116.

20 [0249] The coupon distributor system 114 automatically releases the promotions, on schedule, via modems (not shown) to the pager network 118 which broadcasts the promotions as described above. Modified Coupon Direct appliances 120 sense the signal, filter it, and if

25 the promotion is eligible for reception, decode and store it in a smart card storage device 122. The smart card storage device 122 essentially replaces the printer described above, although it may be built into the unit in addition to a printer or be connected as a peripheral device to the printer via input source such as an RS232 port. Rather than printing a physical coupon on demand, the smart card storage device 122 downloads the terms and conditions 112 of the promotions 110 when a smart card is inserted. The download is processed on the smart card and converted into a readable format.

30 [0250] Prior to the release date of the promotions, terms and conditions 112 are also relayed to the headquarters of participating retailers 116 which coordinate the release of appropriate information to stores in the chain.

35 [0251] The terms and conditions 112 are entered in the store files 124 and activated at checkout registers according to the start and end dates of the various promotions by smart card readers 126 which grant the consumer discounts 128 when the smart card is used. Consumer product usage information will be captured in normal redemption processing, extracted and formatted, then communicated electronically back to the Coupon-Direct database manager 40, and the subscriber directory 10, for subsequent targeting of individuals and groups of users via bit-string coding.

40 [0252] One drawback of the system described and illustrated in FIG. 34 is that the consumer has no way of knowing basic information about the promotions that are stored on the smart card. Knowledge of where the promotion is redeemable, brand information, coupon value and expiration date is essential to purposefully persuade the consumer to make a particular purchase. For purposes of consumer communication, the consumer

would carry the smart card to the store, and makes purchase, including those for which there are promotional offers on the smart card. The consumer may be reminded to purchase specific items in one or more of five (5) methods:

- a) If the smart card writer in the home were attached to a CouponDirect printer a "shopping list" could be printed as a reminder to the consumer of the offers residing on the smart card.
- b) A personal computer could provide the source for information pertaining to current smart card offers, either from the Internet, email or diskette, and a "shopping list" could be printed from one of those sources as a reminder to the consumer of the offers residing on the smart card.
- c) Upon arrival in-store, the consumer may approach a centralized kiosk, endcap or special area with tables or shelves that contain smart card readers and printers. By merely swiping the smart card, the residing offers could be printed in a "shopping list" format, reminding the consumer of which products to purchase. Such "shopping lists" could even be sorted by product category or even per store aisle layout.
- d) Point of Purchase materials (shelf talkers and signage) adjacent to the products in-store that are featured smart card promotional offers for this system could remind consumers of which promotional offers reside on their smart card.
- e) Integrate a smart card terminal into existing automated vending equipment within the store, such as an ATM machine, coin change machine, etc.

[0252] When the cashier swipes the smart card, the system automatically applies discounts, if the items purchased are compliant with the terms of the promotion. This feedback could be provided by an LED or LCD display panel on the smart card device enabling a shopper to hand annotate a shopping list. An interface could be developed between the CouponDirect appliance 120 and a simple calculator printer, or integrated into a printer.

[0253] A personal computer interface could be added to the appliance 120 such that offers could be reviewed on the monitor or printed to any available printer. A smart card reader/writer unit may also be added to the regular CouponDirect appliance 120 either as an integrated component, or a peripheral device.

[0254] Of the above options, one of the more effective communication modes is the printed list, which could be carried to the store as a memory refresher or used in preparation of the consumer's regular/complete shopping list. When the smart card promotions are delivered, a summary list, of the type shown in FIG. 35 can be printed providing ready information for the user. This approach adds great versatility to the overall system, since parallel distribution of printed paper coupons and their

electronic smart card counterparts could occur simultaneously. Since two types of appliances are dispersed to the coupon base, delivery can be in conventional paper only form, smart card only form, or in both forms. The addition of a discrimination bit to the promotion destination code could alert the appliance to what form is involved in each distribution.

[0255] FIG. 36 illustrates the distribution of promotions for delivery in paper, electronic, or both forms. 5 These promotions 130 are broadcast, in the regular method, over the pager network 132. The CouponDirect appliance 134 receives the transmission of the promotions 130. If the target filter accepts the promotion 130 a form bit is interrogated to determine the delivery media.

[0256] If the form is paper only, the routine printer appliance operations 136 print the coupons.

[0257] A software module 138 is added to the appliance 134 which module 38 has the basic capability of summarizing offers delivered in smart card form. Continually updated distribution list 140 keeps the consumer informed as to what active offers are available for use. Operating CouponDirect in this dual channel media mode is very advantageous. Paper coupons are still 20 very attractive for national distributions without retailer limitations whereas smart card offers would only be redeemable at specific retailers equipped with smart card readers.

[0258] A smart card reader 142 is also interfaced to 30 the appliance 134. This interface may be by actual integration into the appliance 134, or simply by hardwire connection to a discrete unit. Smart card offers are written to a card 144 normally docked in the reader. Twin cards would be required so that new offers can be written when the primary card is in use on a shopping trip.

[0259] Major Smart card activity is designed for e-commerce and many security measures are incorporated into writing routines. These measures, along with the required secondary read at the retailer, result in a highly 40 fraud-protected, electronic coupon.

[0260] A coupon distribution system integrated with a global computer network is illustrated in FIG. 37. The key integrating component in this system is a shared smart card reader-writer 150. Again this could be a stand-alone unit or a module integrated into the CouponDirect appliance 152. As shown, the system allows offers distributed over a global computer network, such as the Internet, to be written to the smart card 154 and a list of offers 156 printed off the consumer's personal computer

50 printer 158. Similarly, CouponDirect offers can be written to a smart card 160 and a corresponding, printed offer list 162 be generated by the appliance 152. Of course the distribution of the offers is made by different means for each of these systems: for the global computer network, the offers are distributed by means of an online coupon distributor 164, while the above-described CouponDirect distributor 166 and pager network 168 serves to distribute the offers to the CouponDirect

appliance 152.

[0261] In the preferred embodiment of such a system, the card loaded with CouponDirect offers 160 and the card loaded with global computer network offers 154 would be consolidated into one integrated smart card 170, and the CouponDirect offers list 162 and global computer network offers list 156 would be integrated into one consolidated list 172. A software module could be downloaded from either channel that facilitates merging of both types of offers to the integrated smart card 170 and a consolidated list 172.

[0262] As it may be some time before many stores are equipped with smart card readers in every checkout lane, an economic approach would be to install a smart card reader terminal 180 in the store, as shown in FIG. 38. Ideally, the smart card terminal would be integrated into an existing store installation such as an ATM machine, telephone booth, lottery ticket dispenser, or coin changing machine, for example. The smart card reader unit would essentially consist of a small microprocessor possibly with processing power up to a Pentium II, buffer memory and RAM, on-site hard or optical disk storage up to several gigabytes, communications port, several paralleled, high speed printers (perhaps laser) and/or smart card readers, a multi-digit LCD or LED or possibly even a CRT display, and standard smart card and store interface software.

[0263] Basically the consumer swipes the smart card 182 at the terminal 180, and if the read is successful, the display gives the consumer a visit number 184. The promotions are read off the card, tagged with the visit number 186, relayed to the central store computer 188 and on out to the checkout lanes 190.

[0264] On completing the shopping trip 192, the customer provides her visit number, which is key-entered by the cashier 194. All of the items in her market basket are scanned 196. Any purchases that match an offer on the visit file would be awarded the discount automatically 198. The visit file would be immediately purged after a transaction or deleted if the customer does not get to a checkout lane 190 within a predetermined time. Computing resources at checkout are usually limited so that clean-up routines of this kind are essential.

[0265] Having thus described the invention with particular reference to the preferred forms thereof, it will be obvious that various changes and modifications can be made therein without departing from the spirit and scope of the present invention as defined by the appended claims.

Claims

1. A system for delivering printed packets of information or messages to intended recipients of said packets, said system including:

means for receiving and storing the packets to

be delivered;
a wireless network for transmitting said packets to said recipients; and
a network of printer appliances adapted to receive, selectively process and print said packets.

2. The system of claim 1, wherein said system further includes a subscriber directory for storing subscriber information concerning the intended recipients of said packets.
3. The system of claim 2, wherein said system further includes a database manager for processing said packets from said means for receiving and storing said packets and the subscriber information from said subscriber directory.
4. The system of claim 3, wherein said system further includes a transmission sequence compiler for placing the packets to be delivered into a predetermined order of transmission to the printer appliances.
5. The system of claim 4, wherein said system further includes at least one modem for conveying said packets from said transmission sequence compiler to said wireless network.
6. The system of claim 1, wherein each of said printer appliances are adapted to receive all of said packets and process only those packets intended to be processed by said appliance.
7. The system of claim 1, wherein each of said printer appliances are adapted to transfer said packets to an electronic smart card for subsequent use by the recipient.
8. The system of claim 1, wherein said packets are selected from the group consisting of redeemable coupons, messages, appointment reminders, event tickets, warnings, alerts, and advertisements.
9. A system for delivering printed packets of information or messages to intended recipients of said packets, said system including:
 - means for receiving and storing the packets to be delivered;
 - means for creating a packet bit-string code for each packet based on certain pre-determined criteria;
 - a wireless network for transmitting said packets to said recipients; and
 - a network of printer appliances each having an appliance bit-string code based on certain pre-determined criteria, each of said appliances

- adapted to receive all of said packet, selectively process only those packets having the same bit-string code as the appliance bit-string code, and print said selected packets.
10. The system of claim 9, wherein said system further includes a subscriber directory for storing subscriber information from which said bit-strings are created.
11. The system of claim 10, wherein said system further includes a database manager for processing said packets from said means for receiving and storing said packets and the subscriber information from said subscriber directory
12. The system of claim 11, wherein said system further includes a transmission sequence compiler for placing the packets to be delivered into a predetermined order of transmission to the printer appliances.
13. The system of claim 12, wherein said system further includes at least one modem for conveying said packets from said transmission sequence compiler to said wireless network.
14. The system of claim 9, wherein each of said printer appliances are adapted to transfer said packets to an electronic smart card for subsequent use by the recipient.
15. The system of claim 9, wherein said packets are selected from the group consisting of redeemable coupons, messages, appointment reminders, event tickets, warnings, alerts, and advertisements.
16. A printer appliance for use in receiving and printing packets of information transmitted by wireless means, said appliance including:
- means for receiving said packets of information;
 - means for analyzing said packets to determine whether said packets are intended to be processed and printed by said appliance; and
 - means for printing said packets of information.
17. The appliance of claim 16, wherein said packets of information are selected from the group consisting of: redeemable coupons, messages, appointment reminders, event tickets, warnings, alerts, and advertisements
18. The appliance of claim 16, wherein said appliance includes a unique appliance identification number.
19. The appliance of claim 16, wherein said appliance
- includes an appliance bit-string code identification number identifying certain pre-selected characteristics of its owner.
- 5 20. The appliance of claim 16 wherein said means for analyzing comprises means for comparing an identification number on each of said packets with either the appliance identification number or the appliance bit-string code identification number to determine whether the packets are intended to be processed and printed by the appliance.
- 10 21. The appliance of claim 16, wherein said means for receiving comprises an antenna and wherein said means for analyzing comprises a microprocessor including random access memory, write only memory and an EPROM.
- 15 22. A system for distributing packets of information to individuals at selected retail locations, said system including:
- 20 means for creating said packets of information in a digital format;
- 25 a wireless network for transmitting said packets of information to said retail locations; and a network of printer appliances at said locations, each of said appliances being adapted to:
- 30 selectively receive, process and store said transmitted packets of information; and convert said packets of information into a printed format for distribution to said individuals.
- 35 23. The system of claim 22, wherein said packets of information are redeemable retail coupons.
- 40 24. The system of claim 22, wherein said means for creating includes means for importing textual and graphic information relating to said packets.
- 45 25. The system of claim 22, wherein said means for identifying includes a database manager having a directory of all printer appliances and means for identifying those printer appliances to which each of said packets are intended to be distributed.
- 50 26. The system of claim 22, wherein said means for sequencing comprises a transmission sequence compiler.
- 55 27. The system of claim 22, wherein said wireless network comprises at least one wireless pager
28. The system of claim 22, wherein each of said printer appliances further includes a sensor adapted to detect whether said printed packet has been removed

- from said appliance
29. The system of claim 28, wherein said printer appliance further includes means for printing an additional copy of said packet upon detection by said sensor that said printed packet has been removed from said appliance.
30. The system of claim 22, wherein said printer appliance further includes a motion detector to detect the presence of an individual in the immediate proximity of said appliance and means to display a stimulus upon the detection of the presence of said individual.
31. A secure system for generating and distributing redeemable coupons over the Internet to individuals who select such coupons, said system including:
- means for displaying on an Internet web site at least one coupon to be requested by at least one consumer;
 - means for requesting said at least one coupon; and
 - means for delivering said at least one coupon to all those individuals requesting said at least one coupon in such a manner as to prevent alteration or modification thereof.
32. The system of claim 31, wherein said means for transmitting comprises a telecommunication link between said Internet web site and said computer.
33. The system of claim 31, wherein said means for transmitting comprises a pager or other wireless network for electronically transmitting said at least one coupon and an identification of those requesting said at least one coupon.
34. The system of claim 33, wherein said means for delivering comprises a remote receiver/printer adapted to receive said electronic transmission and convert said transmission into a form for redemption by recipients of said coupon.
35. The system of claim 31, wherein said secure coupon includes at least one anti-fraud feature contained thereon, said anti-fraud features being selected from the group consisting of: colored borders, a plurality of perforations in a predetermined pattern, a background printed pattern, a sequence number and a resolution index
36. A system for distributing packets of information to individuals at selected locations, said system including:
- means for creating said packets of information
- 55
- in a digital format;
means for transmitting said packets of information to said locations; and
- 5 a network of receivers at said locations, each of said receivers being adapted to:
- selectively receive, process and store said transmitted packets of information; and
 - download said packets of information onto a programmable media.
- 10 37. The system of claim 36, wherein said packets of information are redeemable retail coupons.
- 15 38. The system of claim 36, wherein said means for transmitting consists of a wireless pager network for electronically transmitting said packet of information and an identification of those individuals requesting said packet of information.
- 20 39. The system of claim 36, wherein said means for transmitting consists of a global computer network for electronically transmitting said packet of information and an identification of those individuals requesting said packet of information.
- 25 40. The system of claim 36, wherein said means for transmitting consists of both a wireless pager network and of a global computer network for electronically transmitting said packet of information and an identification of those individuals requesting said packet of information.
- 30 35 41. The system of claim 36, further including a means for converting said packets of information into a printed format.
- 40 42. The system of claim 36, further including a means for generating a list of said packets of information.
43. The system of claim 36, wherein said programmable media is an electronic smart card.
- 45 44. The system of claim 43, wherein said electronic smart card includes processing means and electronic storage means.
- 50 45. The system of claim 36, further including means of reading said packet of information from said programmable media.

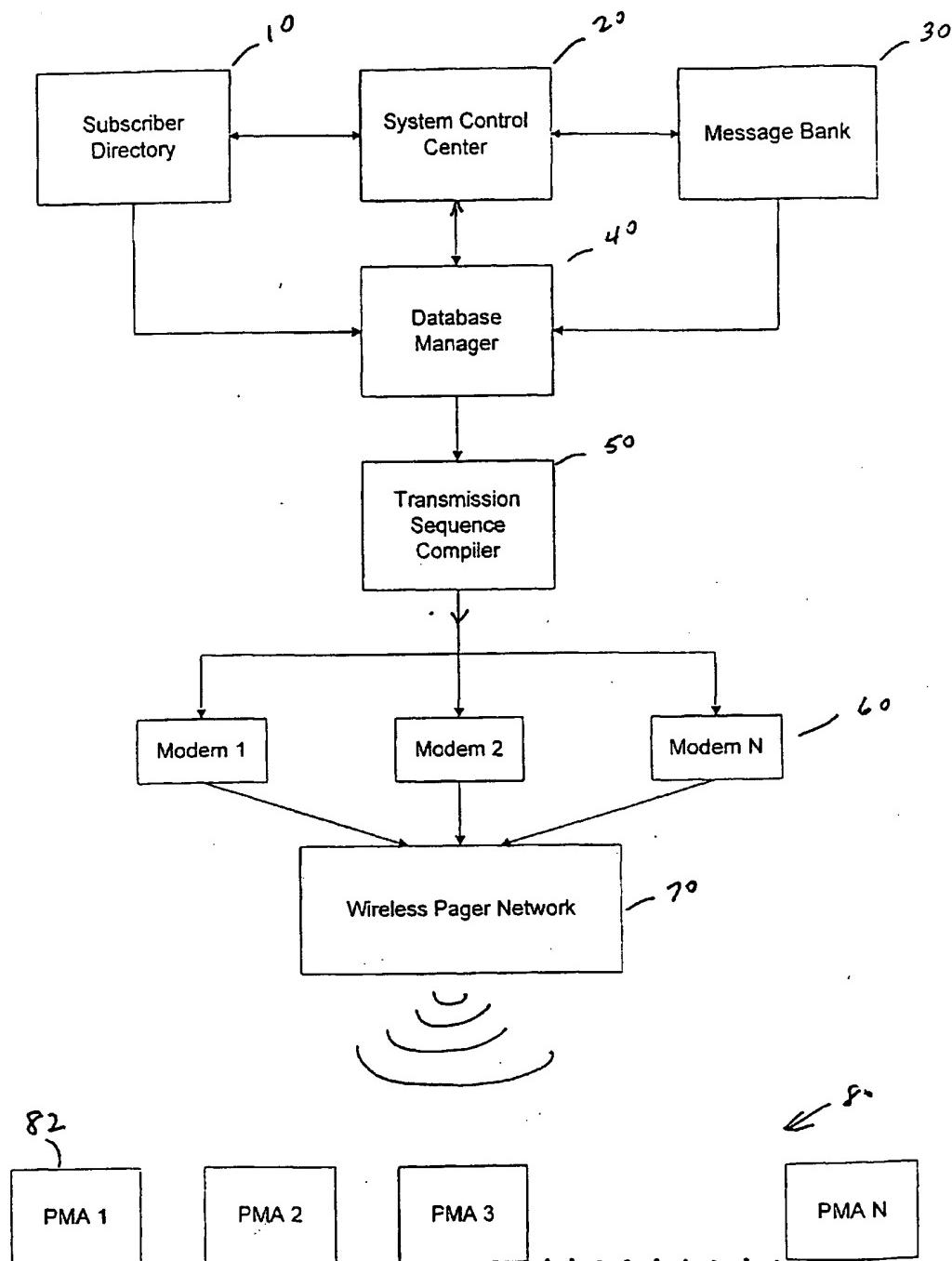


FIG. 1

SUBSCRIBER DIRECTORY									
	NAME	ADDRESS	STATE	ZIP	NAME	REGION	NAME	INCOME	INTERESTS
17482 20791	Jones Smith	Tom Dave	1234 First Street 8989 Melrose Place	El Paso Chicago	TX IL	79932 Southwest 60618 Midwest	2 A, 2C Single Family Apartment	\$ 112,000.00 \$ 41,000.00	Football Football
									Compaq Sony

FIG. 2

PROFILE BIT-STRING GROUPINGS

Bit-String Number	Type	Profile Characteristics
000-100	Geography, Zip Codes	00 National 01-99 Zip Codes
101-130	Household Composition	Number, Males, Females Children, Pets, etc.
131-160	Home Type	Apartment, Townhouse Condo, Single Family
161-170	Household Income	Ranges in \$1K <15; 15-30; 31-50; 61-75, 75-100; etc.
171-200	Lifestyle Interests	Hobbies, Interests, Activities, Affiliations, etc.
201-1000	Brand Usage	Grocer, Department Stores, Automobiles, Computers, Audio Equipment Packaged Goods, etc.

FIG. 3

MESSAGE BANK TABLE

NAME	MESSAGE TYPE	DESTINATION	
		GRAPHICS	PARTIES

FIG. 4**DAILY MESSAGE BATCH.....DUE DATE 6/1/88**

MESSAGE NUMBER	MESSAGE CODE	MESSAGE TYPE	DESTINATION	
			ITEM	ITEMS
1620001	1	Kellog	Coupon	Corn Flakes... \$1.00
1620002	1	IRS	Reminder	Estimated Tax Due by September 15, 1988
1620003	2	Post	Rebate	\$500 Rebate for Escort Owners, Due by 10/1/88
1620004	3	Columbia	Reminder	Motical Visit Appointment
1620005	4	Delle	Confirmation	Prior Day Detail of Reservations
	5	Molly Maid	Reminder	Scheduled Cleaning Visits

FIG. 5

TYPICAL MESSAGE BIT-STRING DESTINATION CODES

MESSAGE TYPE:	COUPON	ADVERTISEMENT WARNING		
Criteria	Zips 76-80 Single Family <u>>\$50K Income</u>	Zips 00-99 All Known <u>Pic 'N Save Shoppers</u>	Zips 60-70 Snow Alert	
<u>Bit String (Category)</u>				
000	Geography	76-80	0-100	60-70
100				
101	Composition	101-130	101-130	101-130
130				
131	Residence	135	131-160	131-160
160				
161	Income	161-170	161-170	161-170
170				
171	Interests	171-200	171-200	171-200
200				
201	Brand Usage	201-1000	443	201-1000
1000				

FIG. 6

INDIVIDUAL MESSAGE CODE STRING

1	2	3	4	5	6	7
1520001	1	Estimated Tax Due 9/15/98; Smiley Face Clip Art	0	99999999	0000000...169...	
1520002	2	Confirmation of Reservations; Logo and Clip Art	1	000123456	+ Private Key	
1520005	3	Reminder to Get Teeth Cleaned	2	000001076	PIN No.	
1520006	4		0	000022085		

FIG. 7EXAMPLE OF DATA CONTENT IN
SAMPLE COUPON MESSAGE

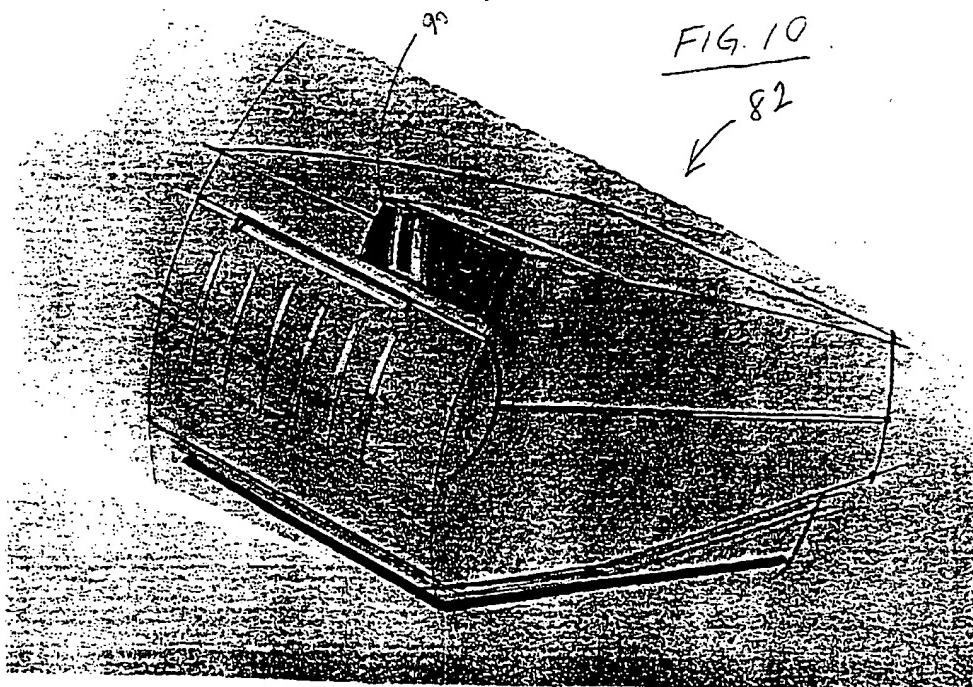
1	2	3	4	5	6	7
1520001	1	Mfg. Logo, product silhouette, value, expire date, terms and conditions of offer, bar code offer number	0	99999999	0000000...169...	
1520002	2	Estimated Tax Due 9/15/98; Smiley Face Clip Art	1	000123456	+ Private Key	
1520005	3	Confirmation of Reservations; Logo and Clip Art	2	000001076	PIN No.	
1520006	4	Reminder to Get Teeth Cleaned	0	000022085		

FIG. 8

MESSAGE IDENTIFICATION NUMBER

tch	Message Sequence Number	Year
	152001	198
	152002	198
	152003	198

FIG. 9



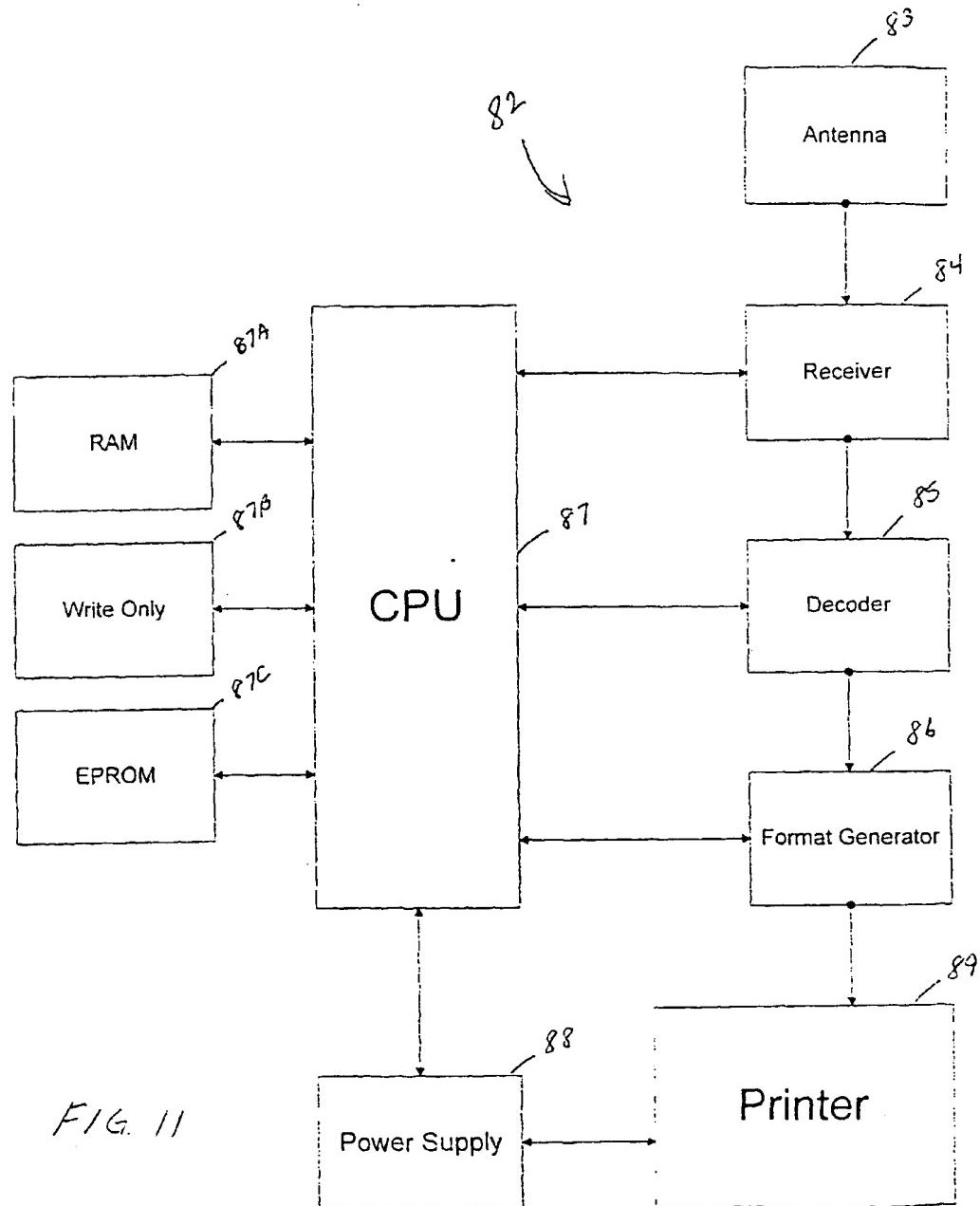
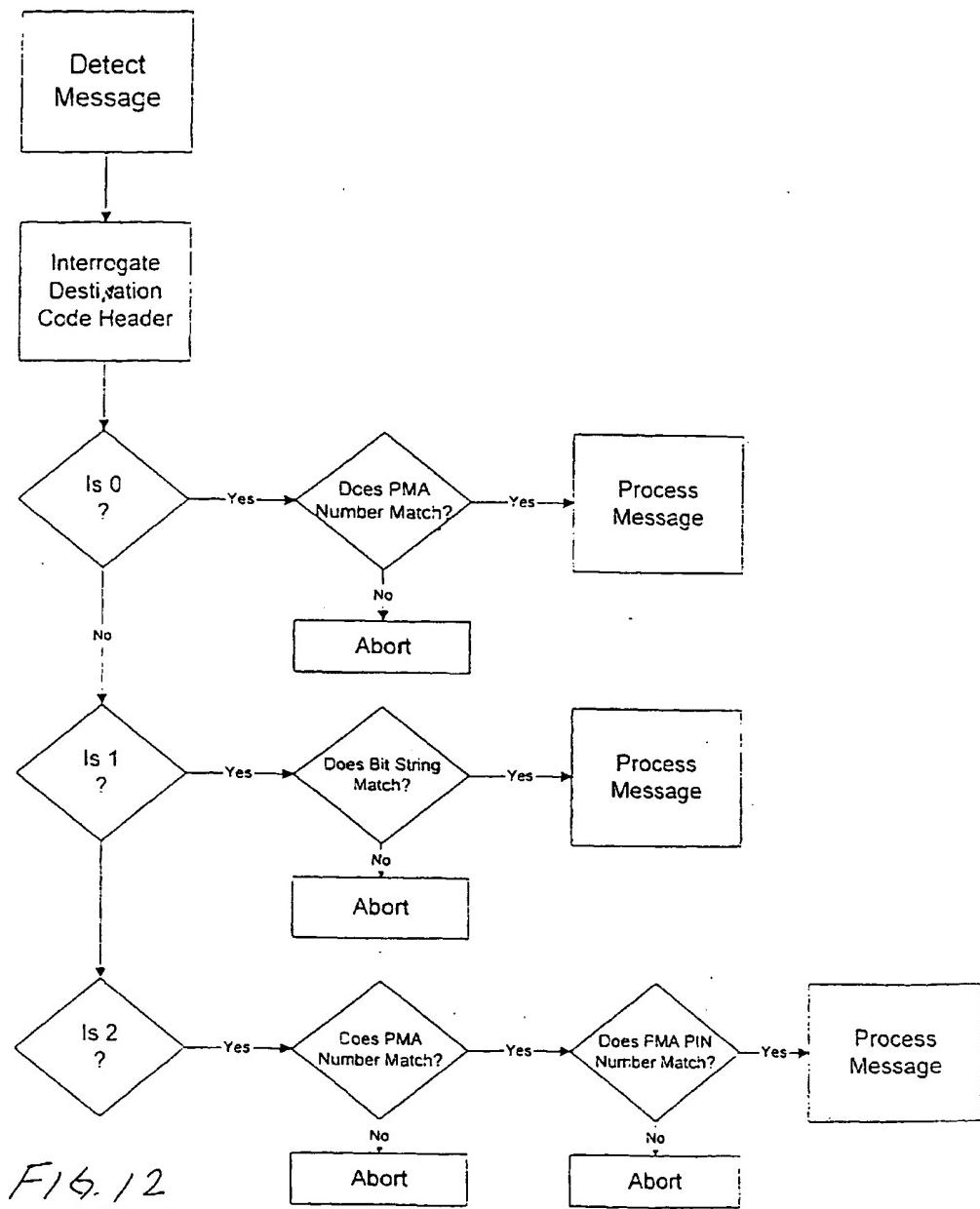


FIG. 11



SAMPLE PMA ELIGIBILITY BIT-STRING CODE NUMBERS

	<u>PROFILE</u>	ACTIVE BITS	<u>PROFILE</u>	ACTIVE BITS
PMA UNIT NO.	17432		20731	
LOCATION 0-100	El Paso Zip 79932	79	Chicago Zip 60616	60
COMPOSITION 101-130	2 Adults 2 Children	128	1 Male	102
RESIDENCE 131-160	Single Family	135	Apartment	132
INCOME 161-170	\$112,000	168	\$41,000	162
INTERESTS 171-200	Gardening Football Computers	174 181 190	Horses Football NASCAR	172 181 187
BRAND USAGE 201-1000	Ford Compaq Dillards Panasonic Kellogg Nabisco	206 312 427 539 611 788	Chevrolet Macintosh Pic 'N Save Sony Post General Foods	208 336 443 588 618 721

FIG. 13

RECEPTION ACCEPTANCE MATCHINGMESSAGE DESTINATION STRING

Coupon	76-80	101-130	135	161-170	171-200	201-1000
Advert.	0-100	101-130	131-160	161-170	171-200	240
Warning	60-69	101-130	131-160	161-170	171-200	201-1000

PMA ACCEPTANCE STRINGS

PMA 17432 79	128	135	168	174,181 190	206,212 227,239 240,251 253
PMA 20731 60	102	132	162	172,181 187	208,236 243,249

RECEPTION ACCEPTANCE TESTPMA 17432

Coupon	Yes	Yes	Yes	Yes	Yes	Yes
Advert.	Yes	Yes	Yes	Yes	Yes	No
Warning	No		Ineligible			

PMA 20731

Coupon	No	Ineligible				
Advert.	Yes	Yes	Yes	Yes	Yes	No
Warning	Yes	Yes	Yes	Yes	Yes	Yes

PMA 20731 accepts and prints the Warning onlyFIG. 14

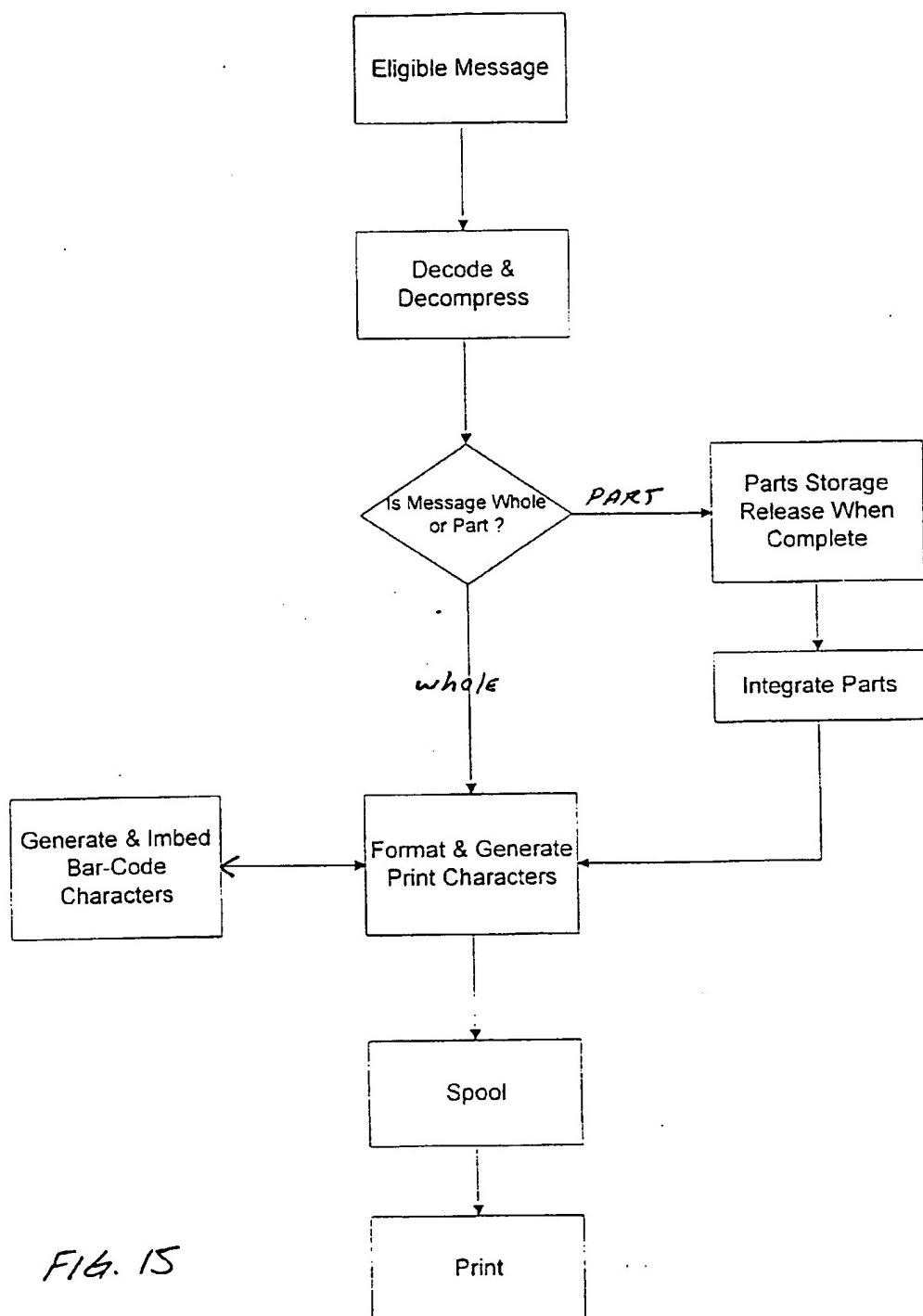


FIG. 15

PRIMARY COUPON DISTRIBUTION SYSTEM

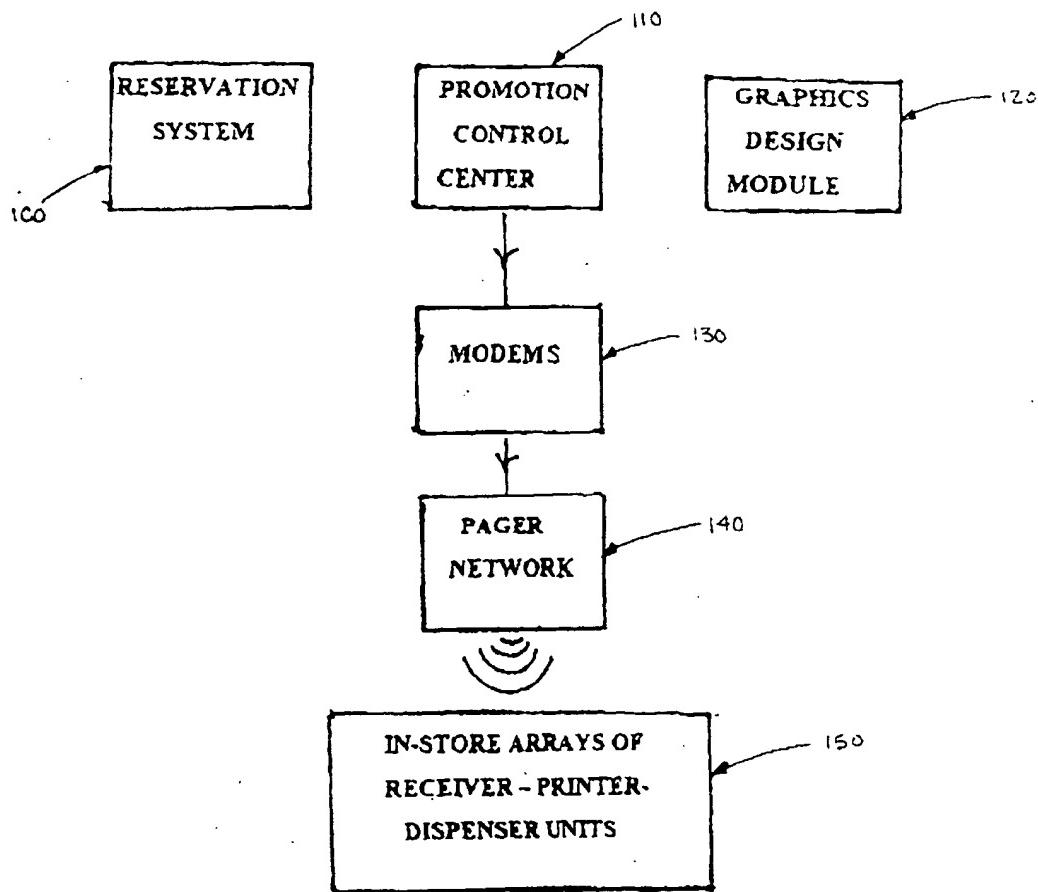
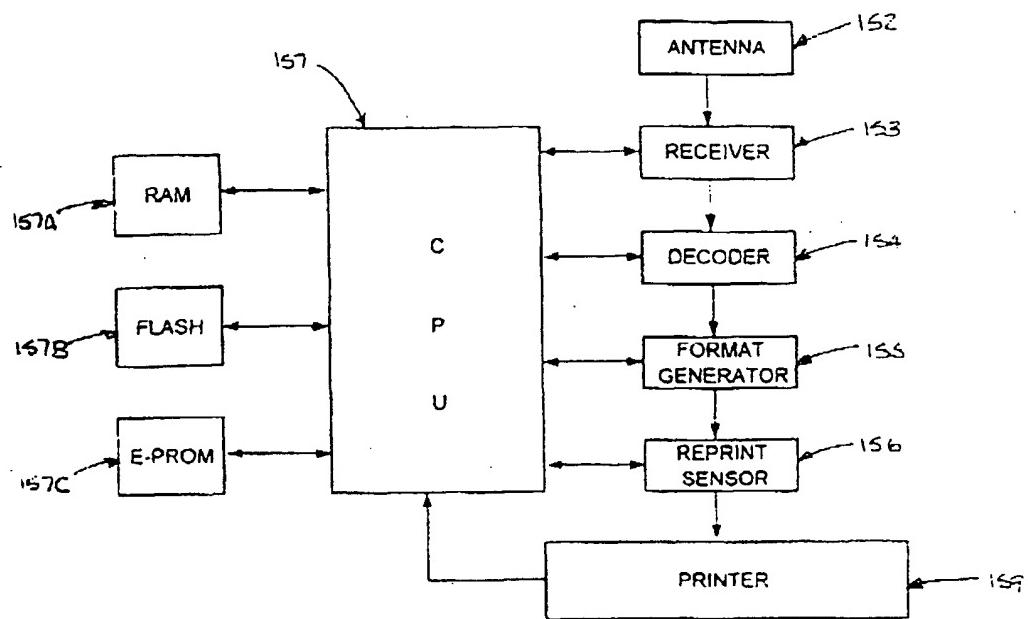
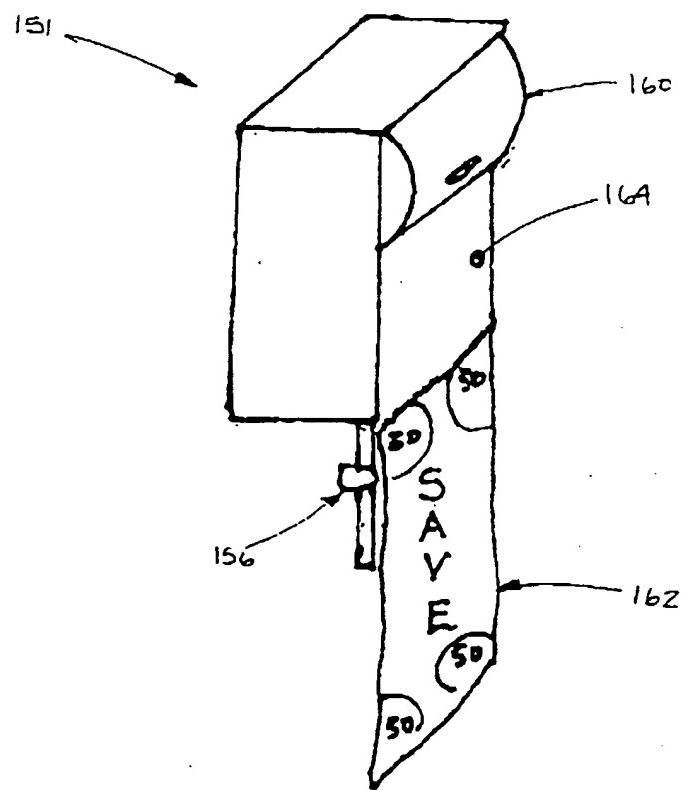


Figure 16



RPD COMPONENTS

Figure 17



BASIC RPD UNIT

Figure 18

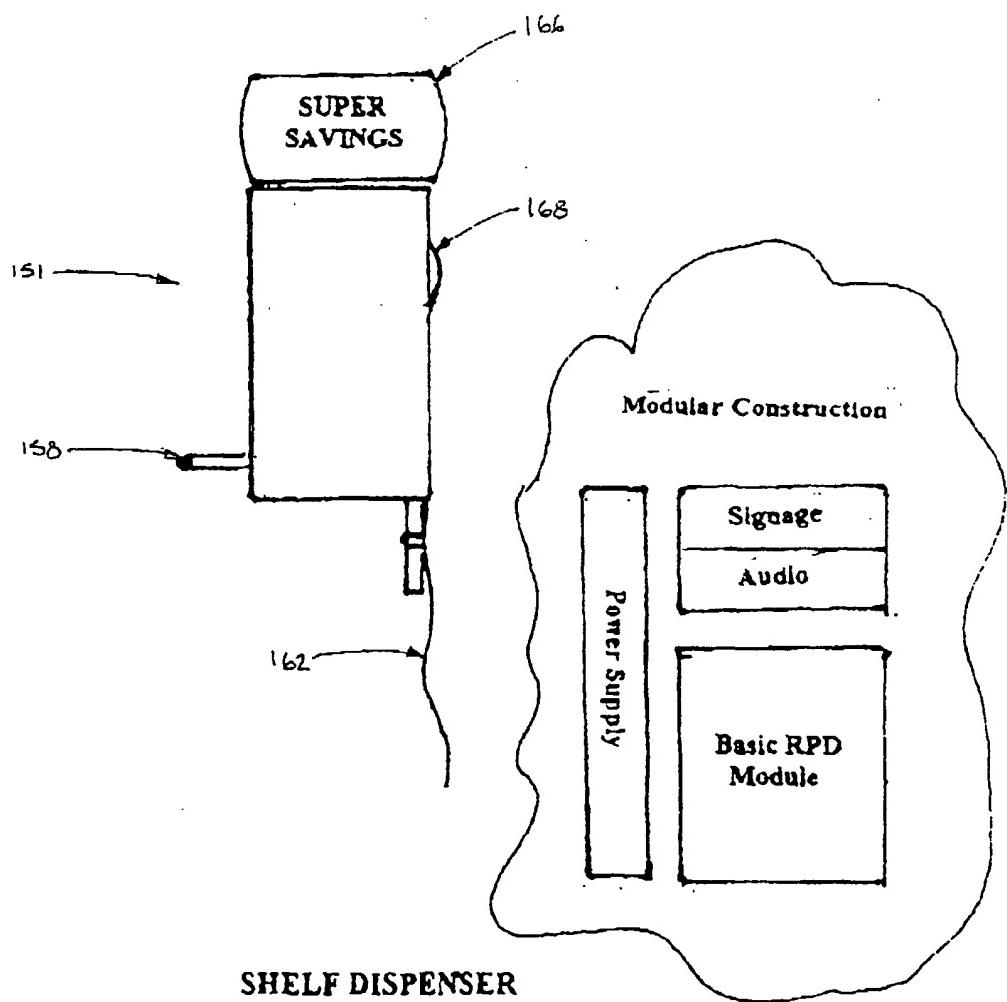
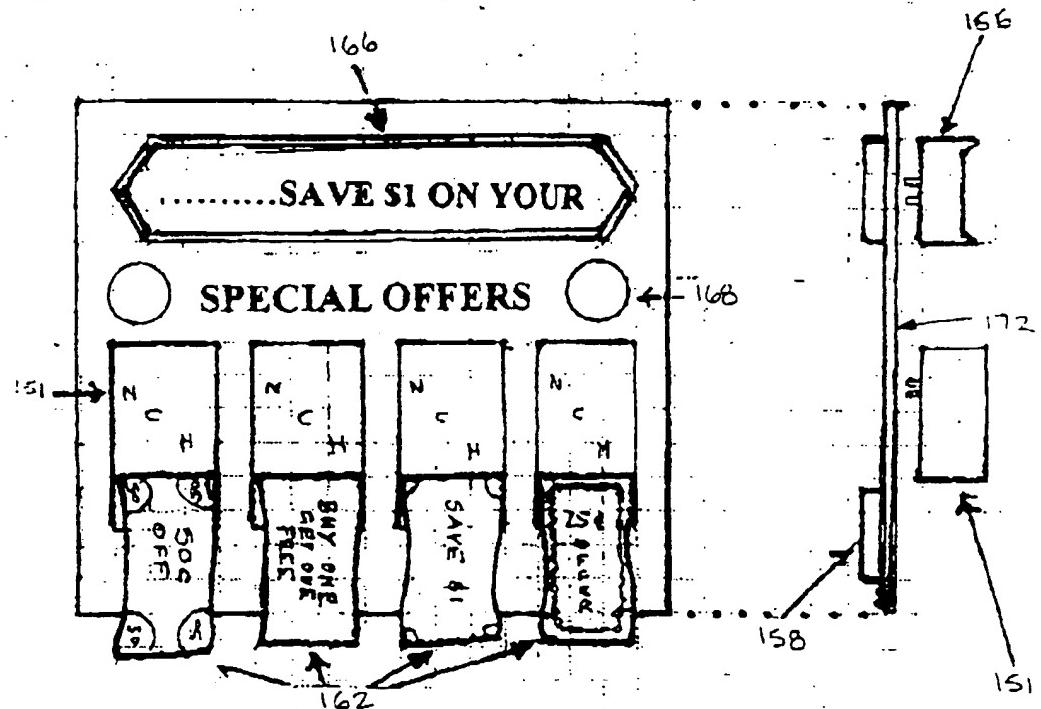
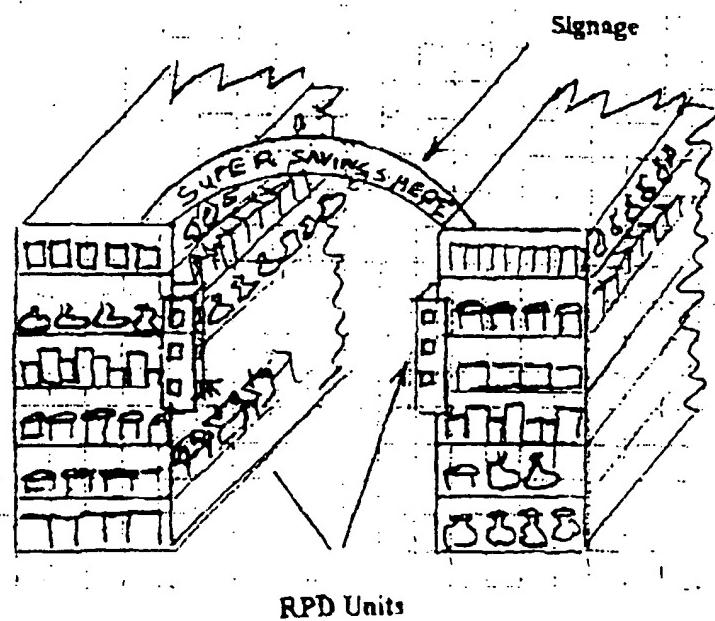


Figure 19



TYPICAL BULLETIN BOARD DISPENSER

Figure 20



END CAP DISPENSER

Figure 21

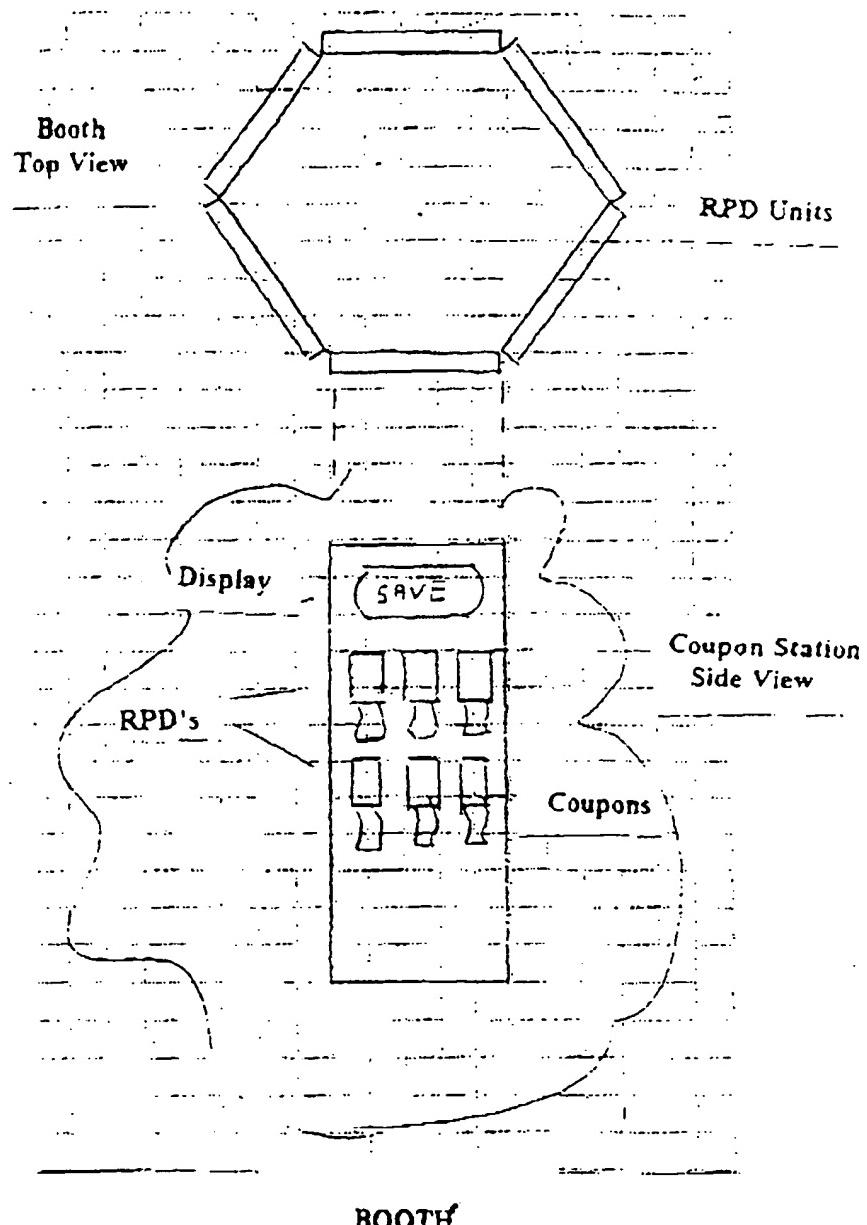


Figure 22

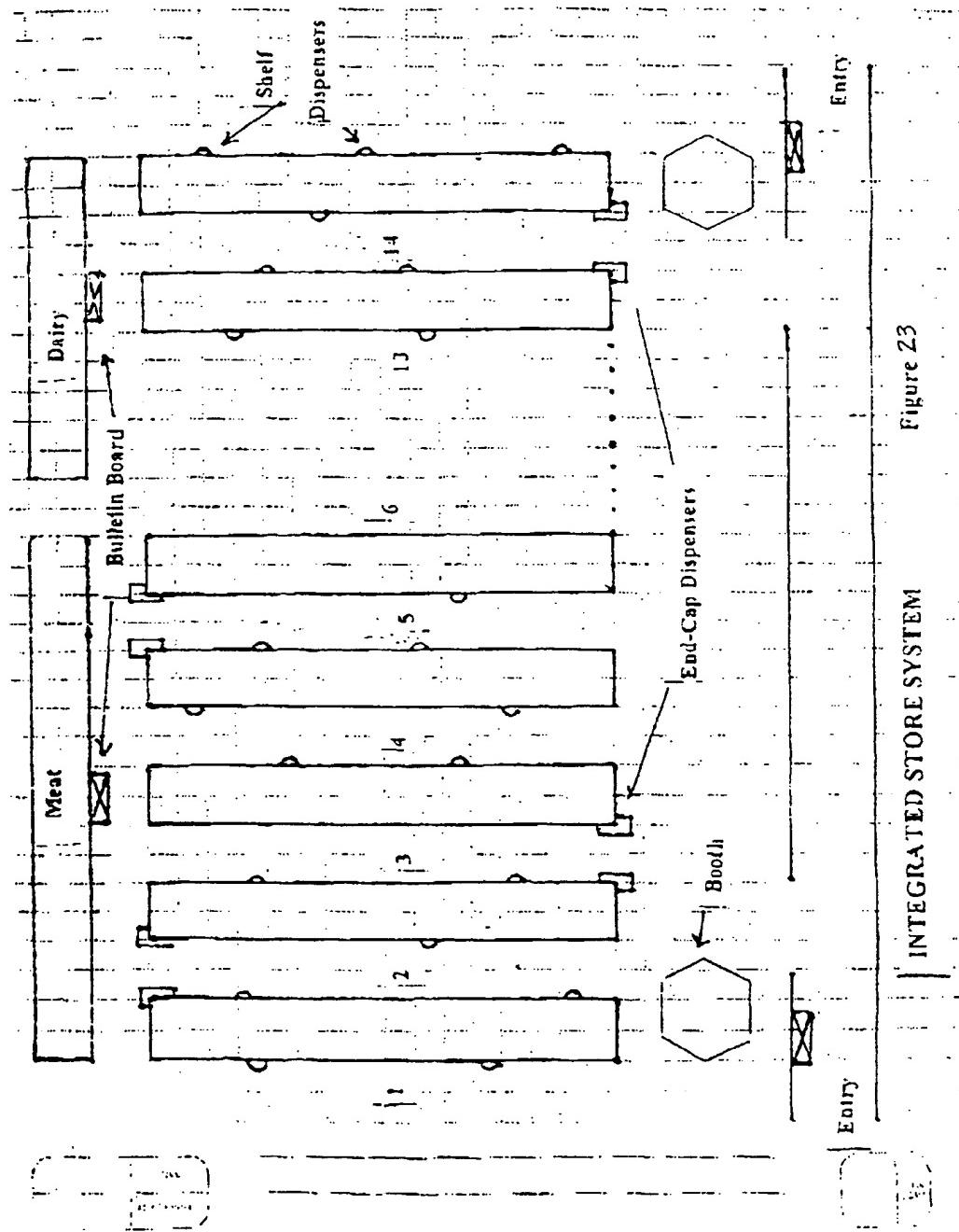


Figure 23

INTEGRATED STORE SYSTEM

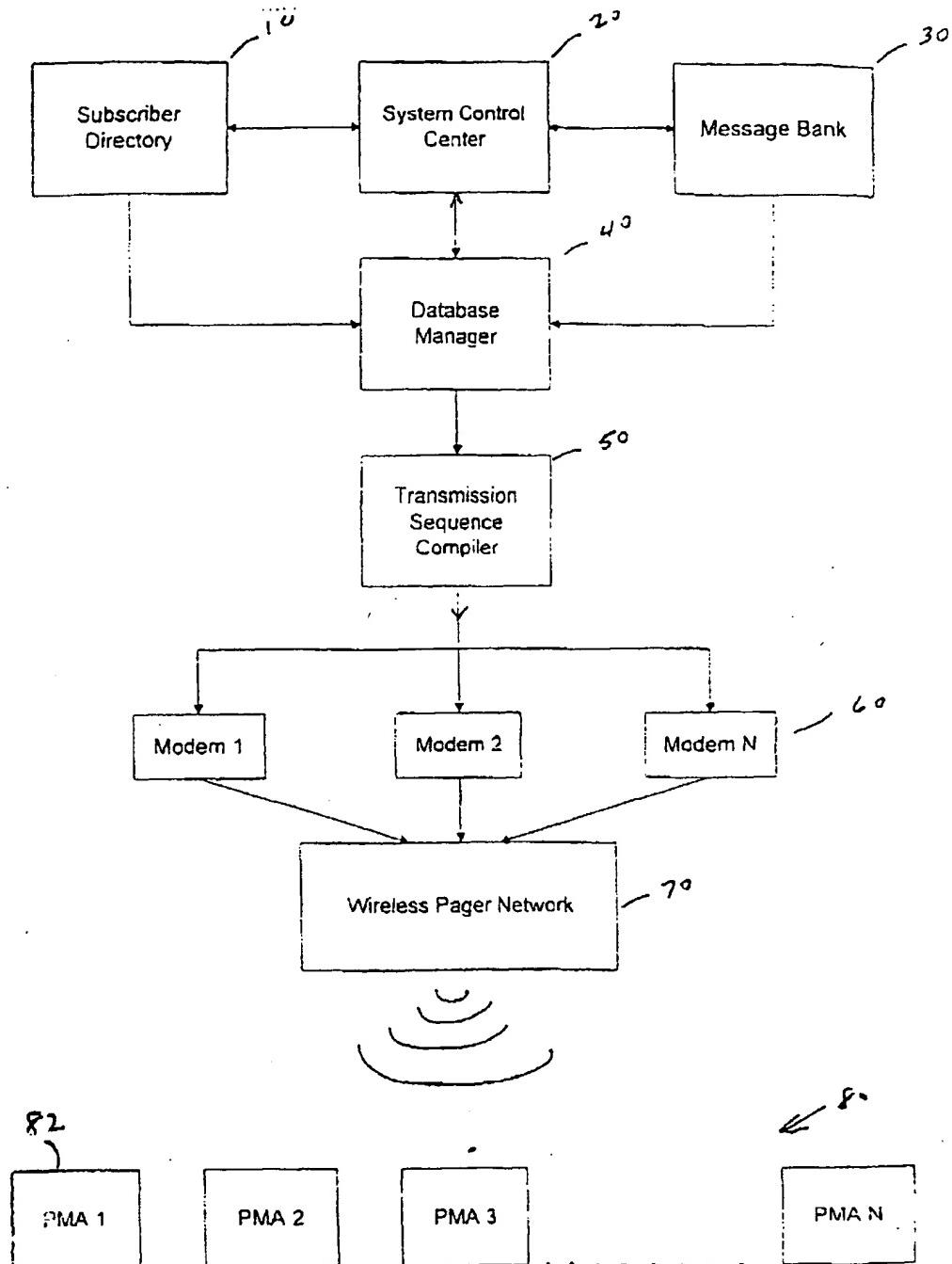
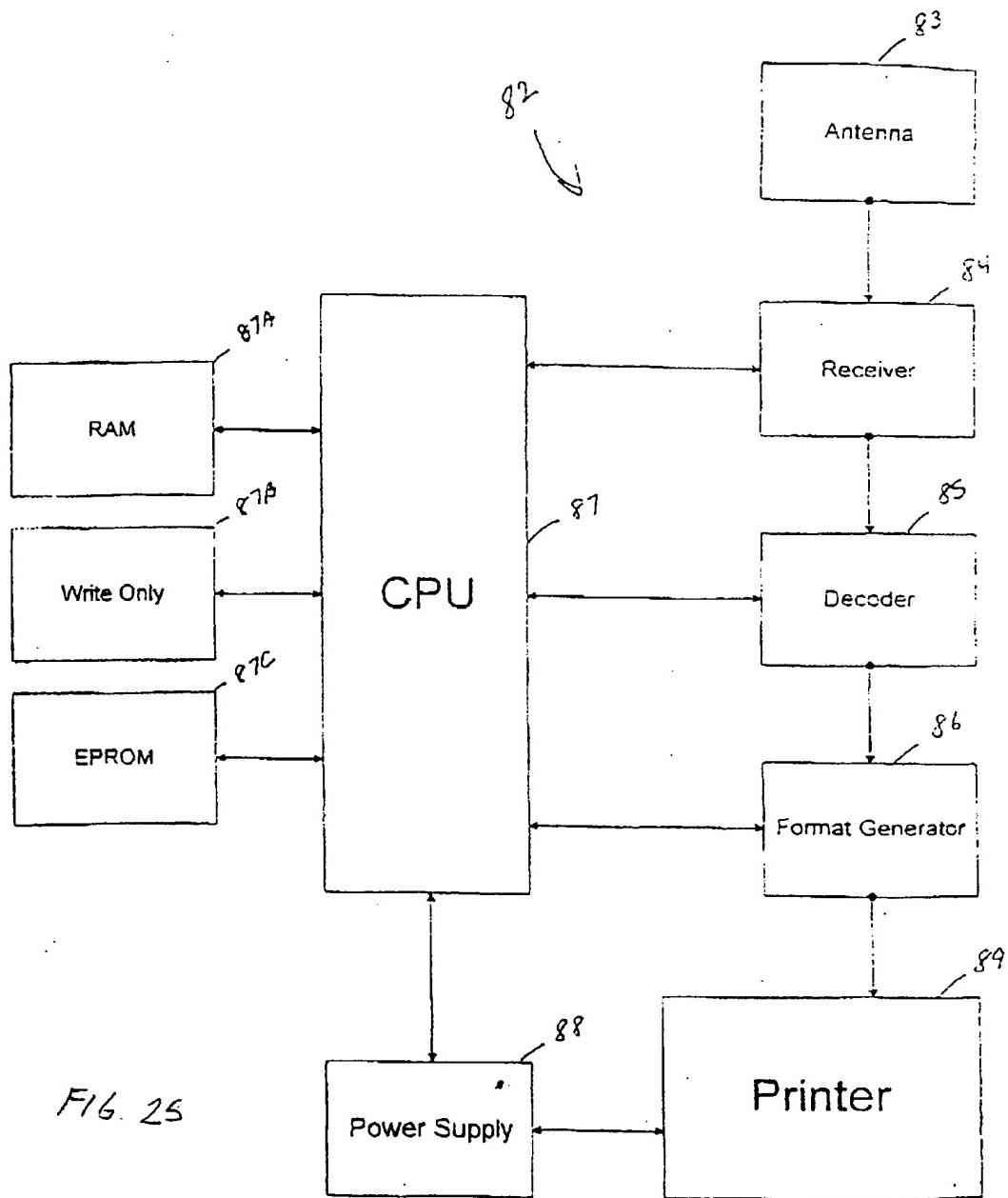
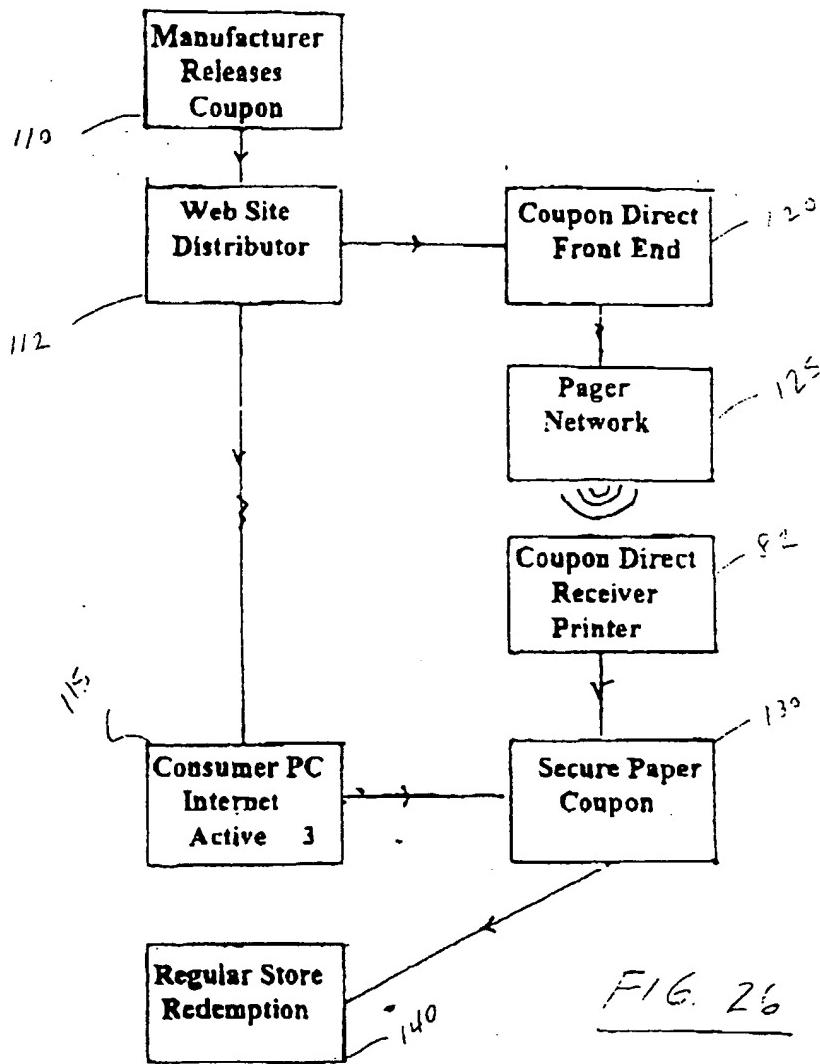
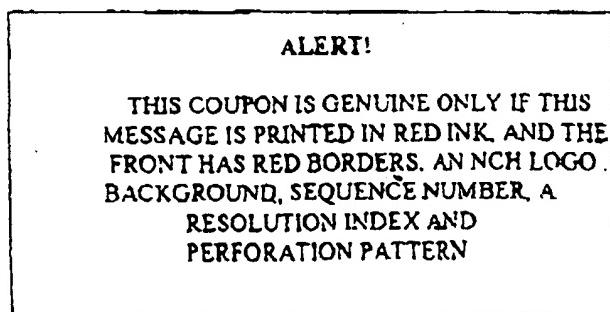
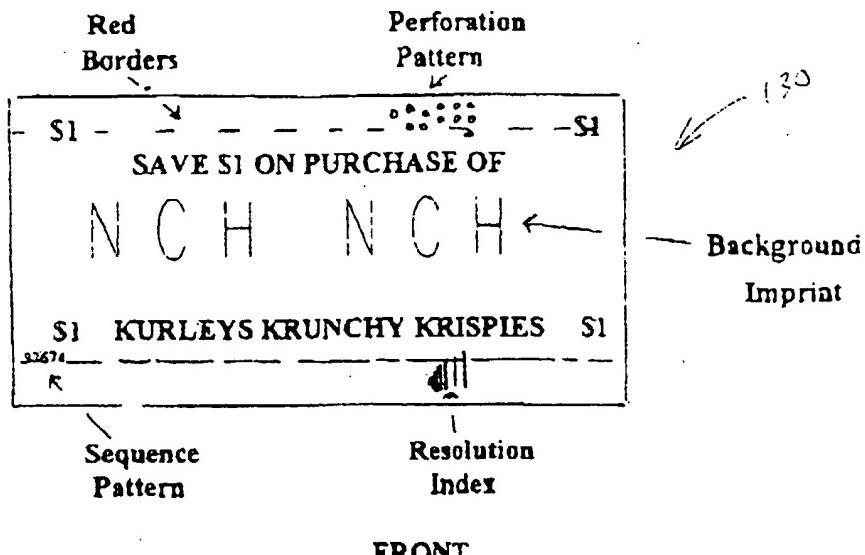


FIG. 24







BACK

FIG. 27

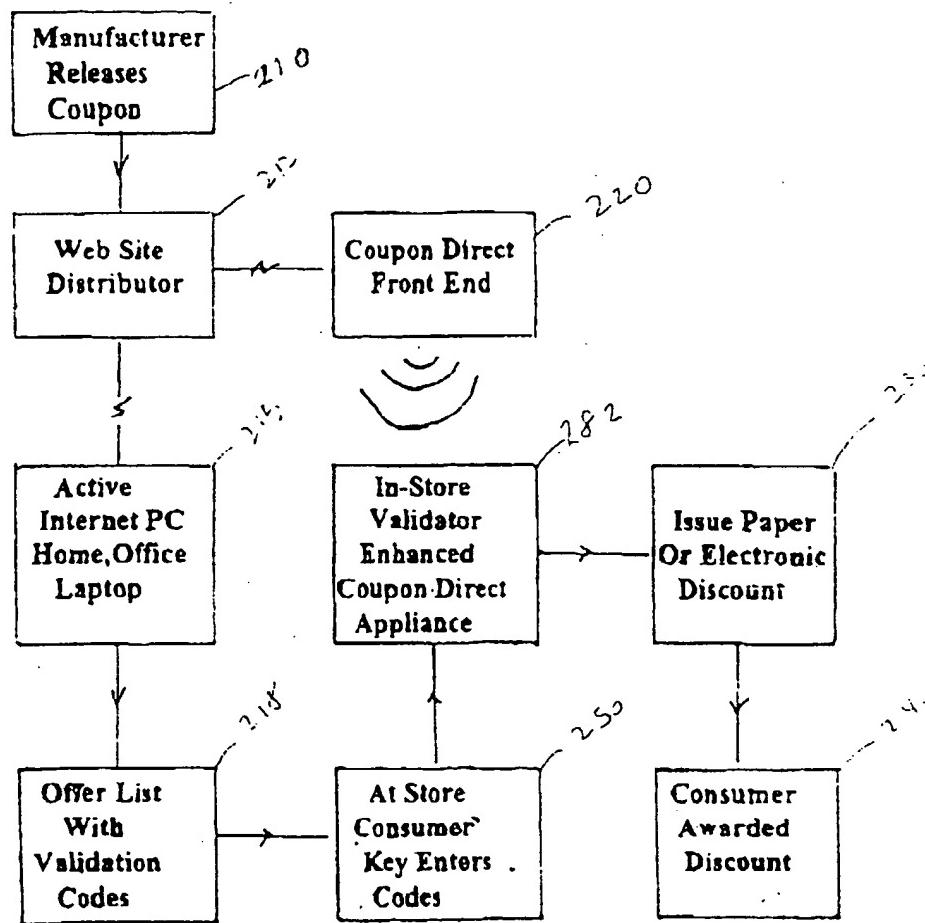


FIG. 28

SUPERSAVER.COM

1/15/1999

Dear Mrs. Mulligan

Here are the discount coupons that you selected

You can save up to \$27 off your regular bill!

All of these offers are redeemable at any Jewel store in your area

Have a good shopping day!

Product Type	Discount Value	Expiration Date	Validation Code
Kelloggs Corn Flakes	\$1.00	2/15/99	79874
Jelly	\$0.75	2/15/99	79875
Nabisco Oreos	\$1.00	3/1/99	79876
Folgers Coffee	\$1.50	3/1/99	79877
Brachs Candy	\$0.80	3/1/99	79877
.	.	.	.
.	.	.	.
.	.	.	.

Total Savings for 21 Items \$27 That's Smart Shopping!

Please remember this list on your next shopping trip

Thank you and come visit us again soon

SUPERSAVER.COM

FIG. 29

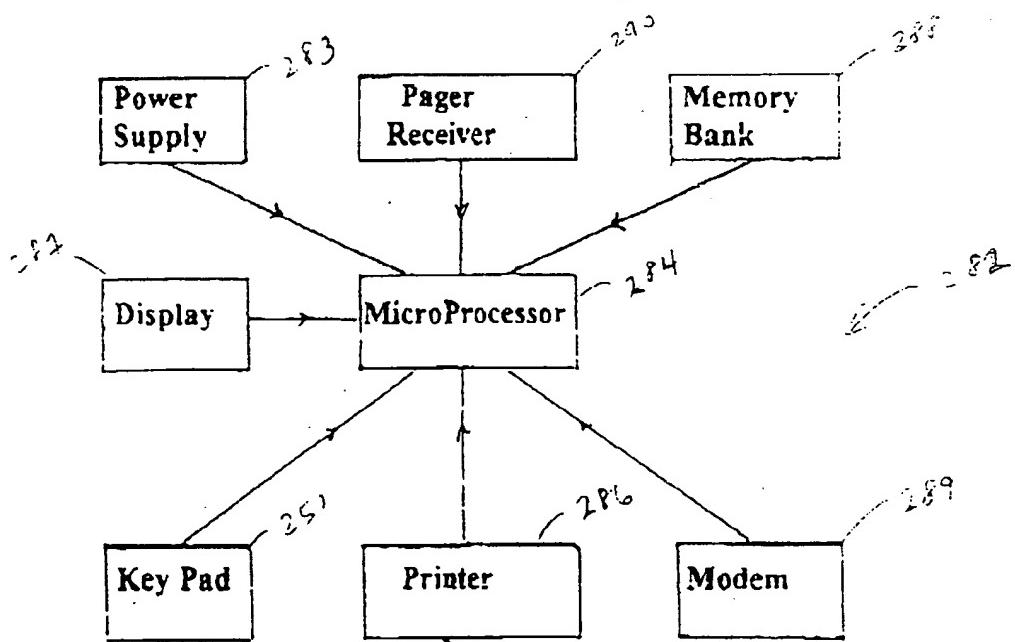


FIG. 30

FEATURE	WEB BUCKS	COUPON DIRECT LINK	IN-STORE VALIDATOR
1 REACH	Limited to Catalogs installed platform base	Limited to CD owner/households	Limited to Validator installed base
2 RECEPTION	Any on-line PC with printer having barcode printing resolution	Any on-line PC linked to a CD	Any on-line PC including lap/palmtops Printer not essential
3 PLATFORM	Very complex Expensive Printer in all Checkout lanes	Not applicable	Simple 1 or 2 per Store
4 RESPONSE COST	Low Internet	High - pager call	low Internet
5 STORE CONTACT COST	High Telephone	Not applicable	low-broadcast
6 ELECTRONIC CLEARING?	Yes but complex 2 Step process	No	Yes in Electronic Form

F/G 31

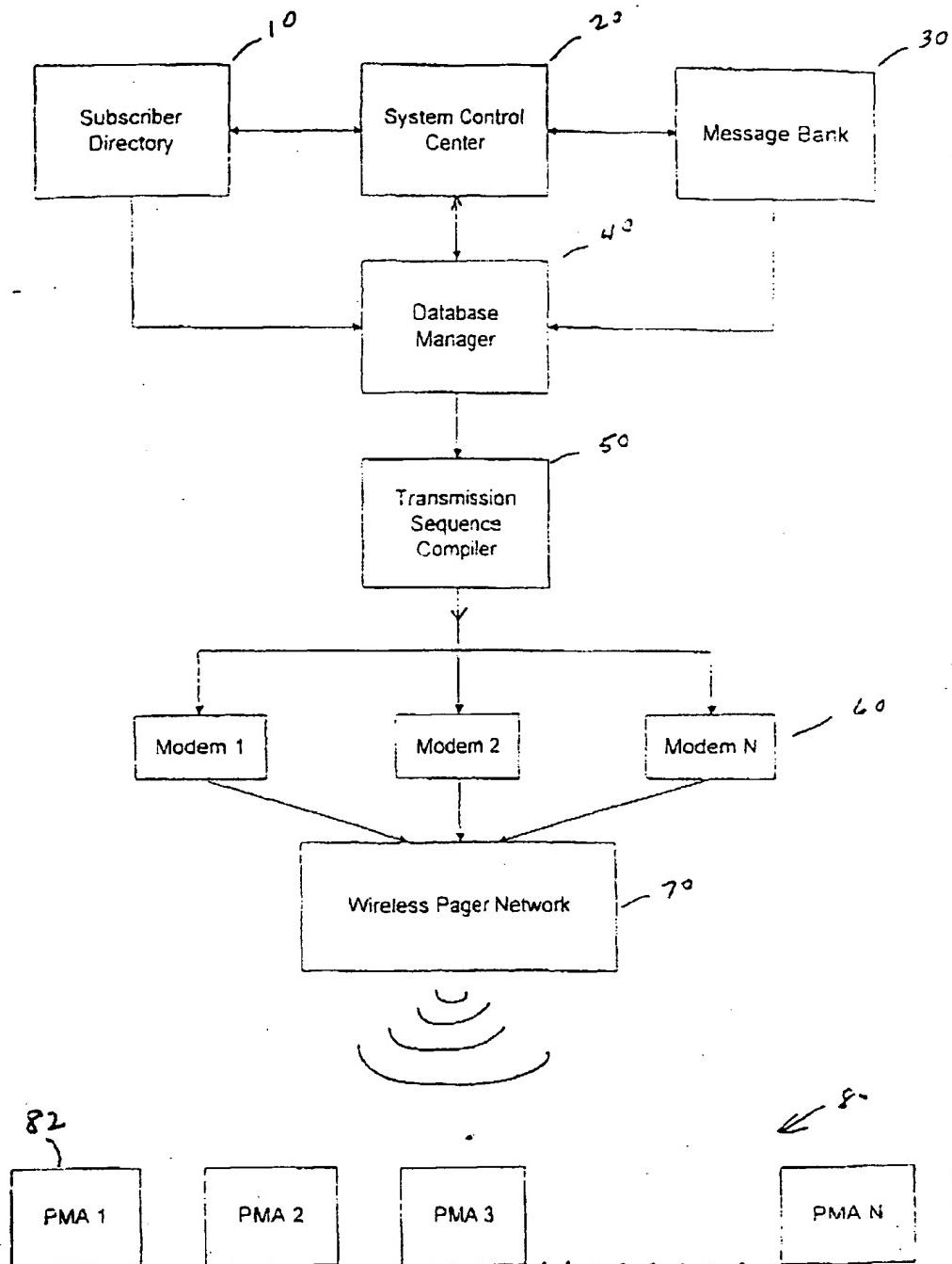


FIG. 32

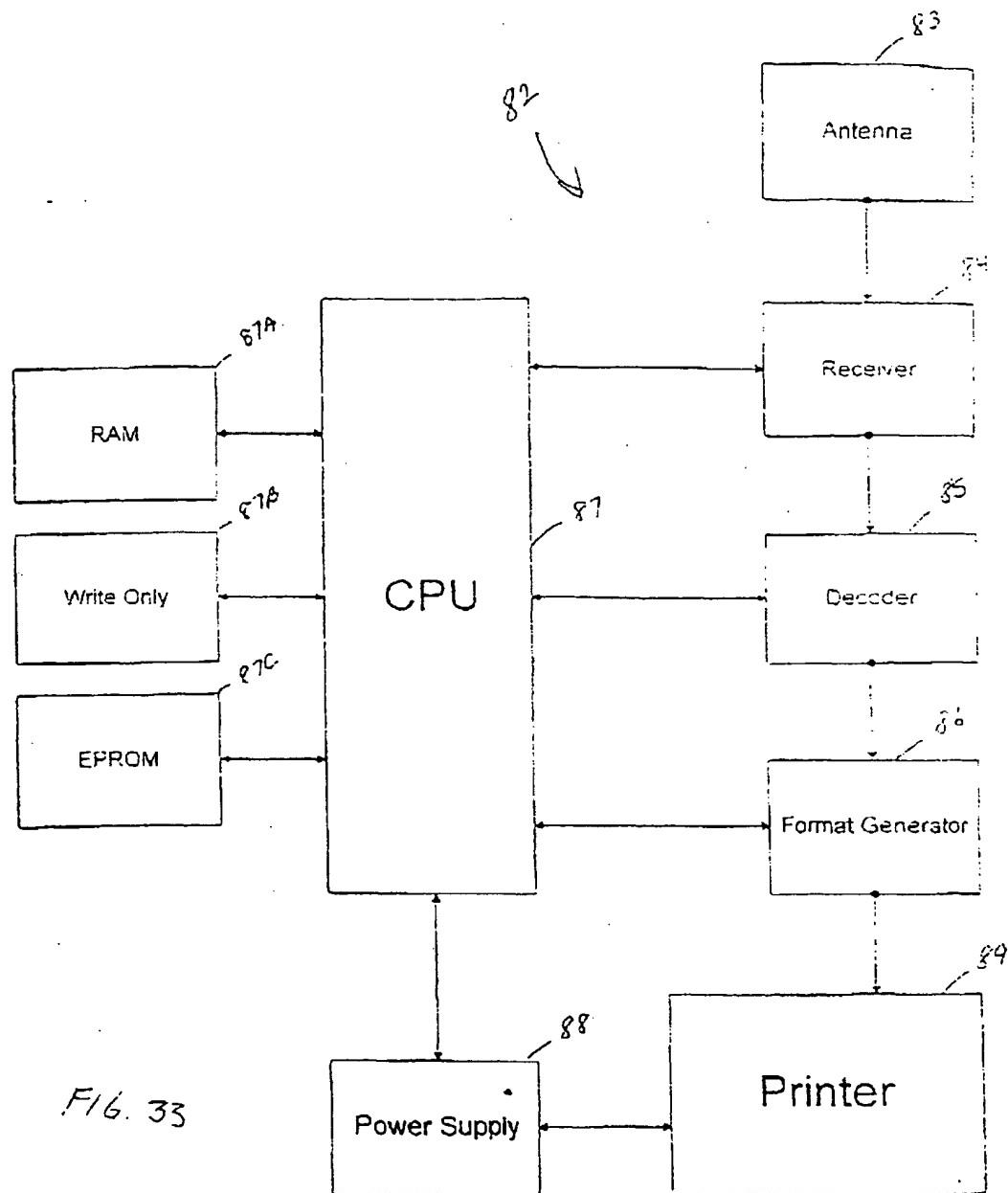


FIG. 33

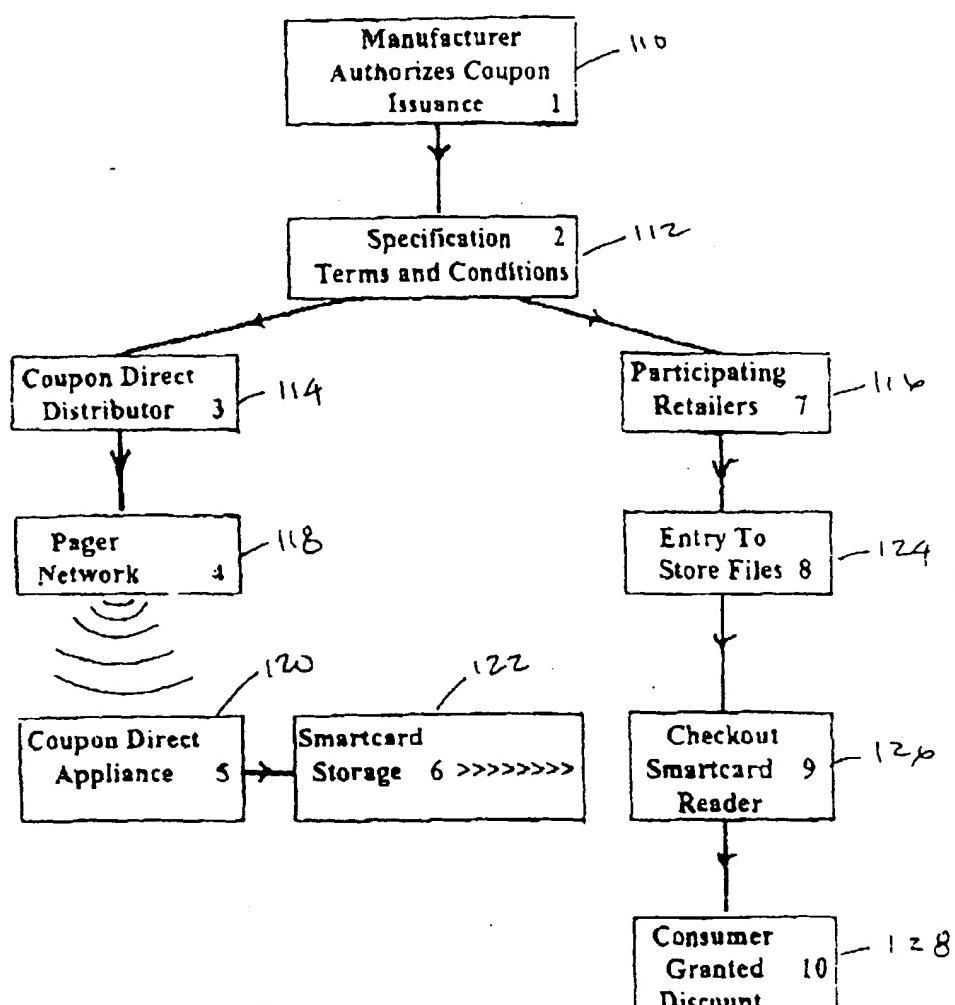


FIG. 3A

WEDNESDAY FEBRUARY 3 1999

KROGER \$1.00 NABISCO OREOS 3/1/99
0.75 HEINZ BEANS LITE 4/1/99
2.00 WINSTON CIGS. 4/1/99
DOMINICK 0.50 LB. BRACHS CANDY 6/15/99

THURSDAY FEBRUARY 4 1999

LUCKY \$0.75 FOUR SEASONS TEA 6/15/99
1.25 CHEERIOS 6/15/99
0.35 CAMPBELLS SOUP 7/15/99
JEWEL \$1.50 FOLGERS COFFEE 7/15/99
0.75 CREST 8/1/99
1.00 TIDE 8/15/99
ETC.

F16 35

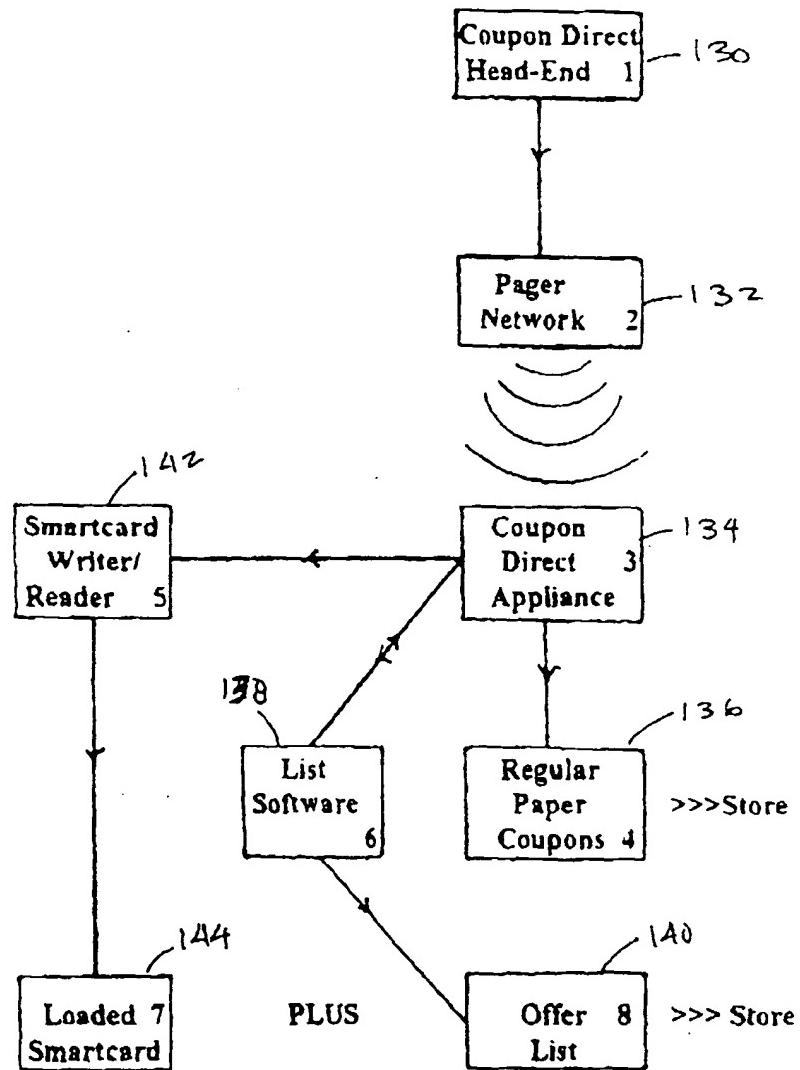


FIG. 36

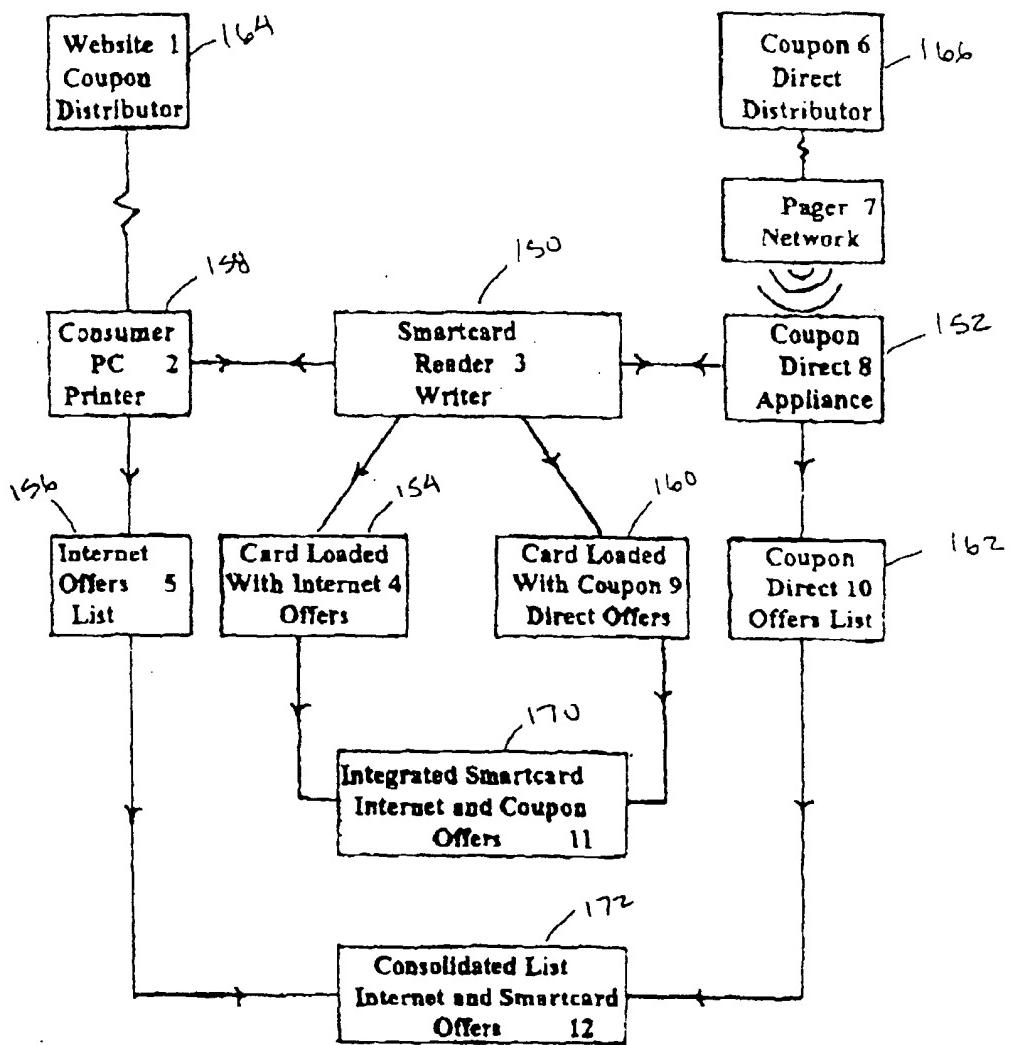


FIG 37

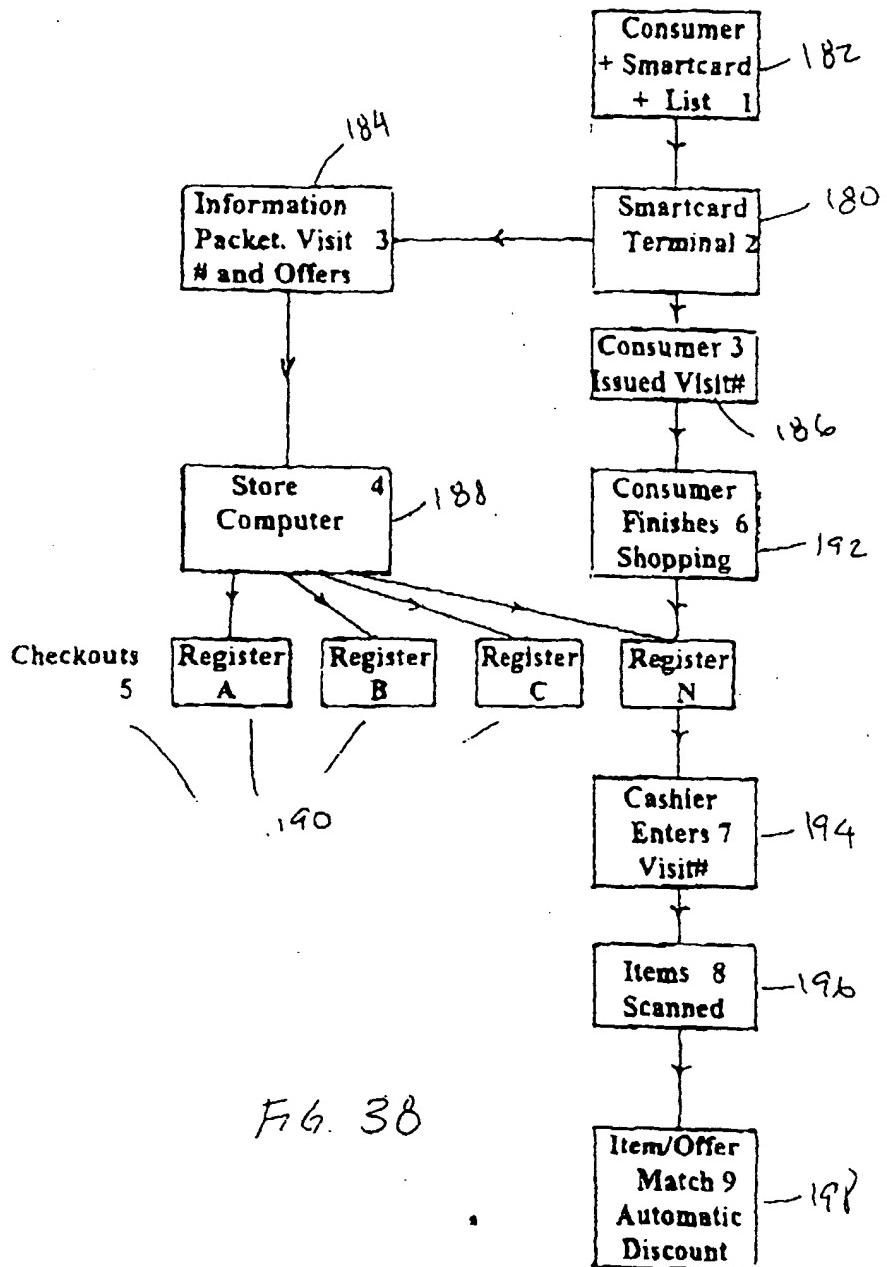


FIG. 38

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